ENGINEERING NEWS-RECORD

Plant in river will keep untreated sewage out p.34

A McGRAW-HILL PUBLICATION

E B POWER
UNIVERSITY MICROFILMS
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ANN ARBOR MICH

To Support Bridge or Building . . .

Specify Long, Straight-Driving, Easy-to-Inspect Armco Foundation Pipe

For practically any foundation need, there is a kind of Armco Foundation Pipe that will meet your requirements. You can be sure of the right foundation for industrial plants, municipal buildings and commercial structures as well as bridges for railways and all types of highways.

Here is condensed data on the four types of foundation pipe supplied by Armco:

ARMCO PIPE PILES

They drive extremely straight. Easily checked for alignment and watertightness after driving. Easy to weld on cut-off sections. Diameters: 8⅝" to 22"; wall thicknesses .141" to .500". Lengths: to 90'.

ARMCO PILE SHELLS

These economical shells are lightweight, helically corrugated. Usually mandrel-driven. Available in 16 different diameter-wall thickness combinations. Supplied in exact lengths up to 60'.

ARMCO CAISSONS

Largest of Armco Foundation Pipe Products, Armco Caissons are available in diameters from 24" to 36"; wall thicknesses from .375" to 500". Caissons can be shipped in lengths up to 70 feet.

COMPOSITE PILES

Frequently, special conditions require foundation pipe with qualities of both pile shell and pipe pile. Or, pile shell with timber. These needs can be met with the wide size range of Armco Foundation Pipe.

After you have checked over this brief data, we suggest you write us about your specific foundation problem. We will be glad to work with you to find the most economical answer.

* * *

Foundation pipe is just one group in the 30 all-metal products supplied by Armco for industrial, commercial, highway and railway applications. For additional data on foundation pipe, send coupon. Armco Drainage & Metal Products, Inc., 5208 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

NEW FREE BOOKLET

ARMCO®

Armco Drainage & Metal Products, Inc.
5208 Curtis Street, Middletown, Ohio

☐ Send FREE Booklet on Foundation Pipe.
☐ Have representative call.

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B.F.Goodrich

B.F.Goodrich Rock Service tires speed highway construction for contractor

CKG ASSOCIATES put 115 pieces of equipment on the job to speed completion of the Northern Illinois Toll Road near Elgin. Trucks, tractors, earthmovers, cement-mixing machines —all work 12 hours a day, 6 and 7 days a week. Helping this equipment stay on schedule are 8 different types of B.F.Goodrich tires, headed by the new Rock Service Tubeless. Fast, expert on-the-job tire service given by the local B.F.Goodrich dealer is one reason for this choice.

Another is outstanding tire performance. The new B.F.Goodrich Rock Service tire is built to its inflated shape. The whole tire flexes evenly—no *localized* stresses that often cause unnecessary tire failure. The B.F.Goodrich FLEX-RITE NYLON cord body withstands double the impact of ordinary cord materials, resists heat blowouts and flex breaks. Result: more retreadable Rock Service tires.

The Rock Service double chevron tread gives maximum traction. Rugged sidewalls defy rock bruises. And B.F.Goodrich Tubeless construction is available. It protects against punctures, cuts maintenance costs, is easier to service. Tires run cooler.

See B.F.Goodrich Rock Service Tubeless or conventional tires at your nearby B.F.Goodrich dealer, who is listed under Tires in the Yellow Pages of your phone book. He has a money-saving tire for every construction job. *B.F.Goodrich Tire Co., A Division of The B.F.Goodrich Co., Akron 18, Ohio.*

Specify B.F.Goodrich Tubeless or tube-type tires when ordering new equipment

B.F.Goodrich *truck tires*

© The B.F.Goodrich Company

HOW TO RUB or GRIND CONCRETE

Today, more and more builders specify a fine finish for concrete walls and ceilings. Because of this new requirement, and of the time and expense involved for hand finishing large areas, Stow Manufacturing Company has developed two, easily portable flexible shaft grinders for finishing concrete. These grinders are electrically powered.

Two methods are used to smooth off hardened concrete: wet rubbing and dry grinding. Wet rubbing—required for smoothing green concrete to a plaster-like finish. Use slow speed grinding wheel or disc. Apply water while grinding. Wet concrete can also be painted on with a brush, then smoothed into holes with the grinding wheel. Dry Grinding—use a high speed grinding wheel or abrasive disc to smooth dry concrete.

Either of Stow's portable electric grinders, the ½ HP model G40-C or the ¾ HP model JT-50, can be used for wet or dry grinding. Both models are available with open or totally enclosed motors, and are equipped with 8 or 12-ft. flexible shafts. Angle heads with different speed ratios can be selected. Write for STOW's pamphlet, Grinding Concrete for complete information on proper speeds, grinding discs and wheels for both wet and dry concrete finishing. Stow Manufacturing Co., Binghamton, N. Y. also makes a complete line of concrete vibrators, rotary trowels, and screeds.

STOW MANUFACTURING CO.
19 Shear St., Binghamton, N. Y.

Please send me your pamphlet, GRINDING CONCRETE.

Name.....**Title**.....

Company.....

City.....**Zone**...**State**....

ENGINEERING NEWS-RECORD

EIGHTY-FOURTH YEAR OF PUBLICATION

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How a Four-Man Crew laid 1500 feet a day of

CLOW Bell-Tite® pipe

through Florida swampland

CLOW cast iron pipe, with the sensational Bell-Tite joint, proved its advantages conclusively in this Clearwater, Florida, installation.

That a four-man crew was able to lay this CLOW Bell-Tite pipe at 1500 feet a day under these adverse conditions is definite evidence of the time, labor and money-saving advantages of this CLOW-designed joint. Two men worked in the trench—often in 3 feet of water. One man lubricating and aligning the joints, the other assembling with a pinch bar. A crane operator and a hook-up man completed the crew.

CLOW Bell-Tite forms a pressure-tight joint—instantly—no bolts or follower glands required. Under practically all conditions, it is the fastest, easiest and most economical pipe for water main installation. Underwriters' Laboratories Inc. listed in diameters 3- through 24-inch.

Shows simple assembly of CLOW Bell-Tite joint. Just wipe clean, lubricate and push spigot into the bell. When painted yellow stripe is no longer visible, joint is bottle tight.

Under-water assembly of 8" Bell-Tite pipe at Clearwater, Fla.
Contractor: Hancock Pipe Company, Clearwater, Fla.

JAMES B. CLOW & SONS, Inc.

CLOW 1878 ®

201-299 North Talman Avenue, Chicago 80, Illinois

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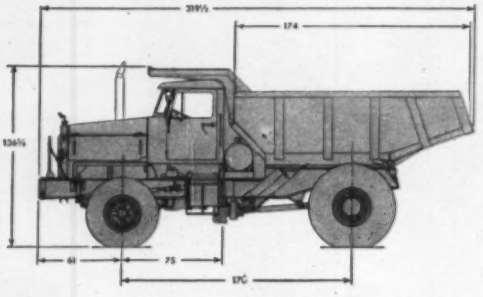
Eddy Valve Company, Waterford, New York
Iowa Valve Company, Oskaloosa, Iowa

MACKS FOR EVERY

MACK MODEL LVX

As a 22½-ton rear dumper, the off-highway LVX offers maximum payloads at minimum unit cost. With either a 320- or 335-h.p. diesel engine, an over-gear transmission with two-speed compound or torque converter, and Mack's Planidrive rear axle . . . the LVX is a top performer under all operating conditions. Maximum driver efficiency is assured by such features as ideal steering wheel position, power steering, two-plate air-assisted clutch, and Mack offset cab with extreme left driver position offering maximum view front and rear. From top to bottom, this Mack has the features that have made it the popular "big boy" for heavy construction.



CONDENSED SPECIFICATIONS

PAYLOADS: Rear dumper, 22½ tons.

DIESEL ENGINES: 320 h.p., supercharged Cummins; 335 h.p., turbocharged Cummins.

TRANSMISSIONS: Mack, selective, constant mesh, 8 speeds forward, 2 reverse; converter and Mack 4-speed transmission; Torqmatic converter and transmission.

CLUTCH: Mack two-plate, air assist with manual actuation.

FRONT AXLE: Mack, heavy-duty, drop-forged I-beam.

REAR AXLE: Mack Planidrive, with final reduction through planetary gears within wheel hubs.

BRAKES: Full air, with 12 cu. ft. compressor.

FRAME: Alloy steel, wide flange I-beam.

SPRINGS: Front, semi-elliptic with Rubber Shock Insulator suspension; rear, progressive-rate semi-elliptic with cam face slipper ends and radius rod.

TIRES: Front, 14.00-24 (16P) rib or 14.00-24 (20P) rib; rear, 18.00-25 (24P) lug.

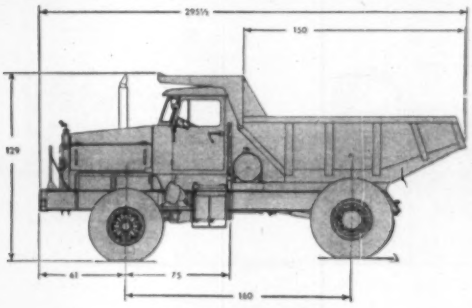
WHEELS: Cast, spoke.

STEERING: Hydraulic power steering, 62' turning circle diameter.

DUMP HOIST: Twin, double-acting, outboard mounted, three-section telescopic cylinder assembly, providing 70° dumping angle.

CONSTRUCTION JOB

excavating...
filling...
equipment hauling



CONDENSED SPECIFICATIONS

PAYLOADS: Rear dumper, 15 tons.

DIESEL ENGINES: 172 h.p., naturally-aspirated Mack Thermodyne; 220 h.p., naturally-aspirated Cummins; 205 h.p., turbo-charged Mack Thermodyne.

TRANSMISSION: Mack, selective, constant mesh, 10 speeds forward, 2 reverse.

CLUTCHES: Mack single-plate, 253 sq. in. engagement (for 170 h.p. Mack Thermodyne); Mack two-plate, 416 sq. in. engagement for other sizes.

FRONT AXLE: Mack, heavy-duty, drop-forged I-beam.

REAR AXLE: Mack Planidrive, with final reduction through planetary gear train within wheel hubs.

BRAKES: Full air, with 12 cu. ft. compressor.

FRAME: Wide flange, rolled section I-beam.

SPRINGS: Front, semi-elliptic with Rubber Shock Insulator suspension; rear, progressive-rate semi-elliptic with cam face slipper ends and radius rod.

TIRES: Front, 12.00-24 (16P) rib, 13.00-24 (18P) rib; rear, 14.00-24 (18P) lug, 16.00-25 (20P) lug.

WHEELS: Cast, spoke.

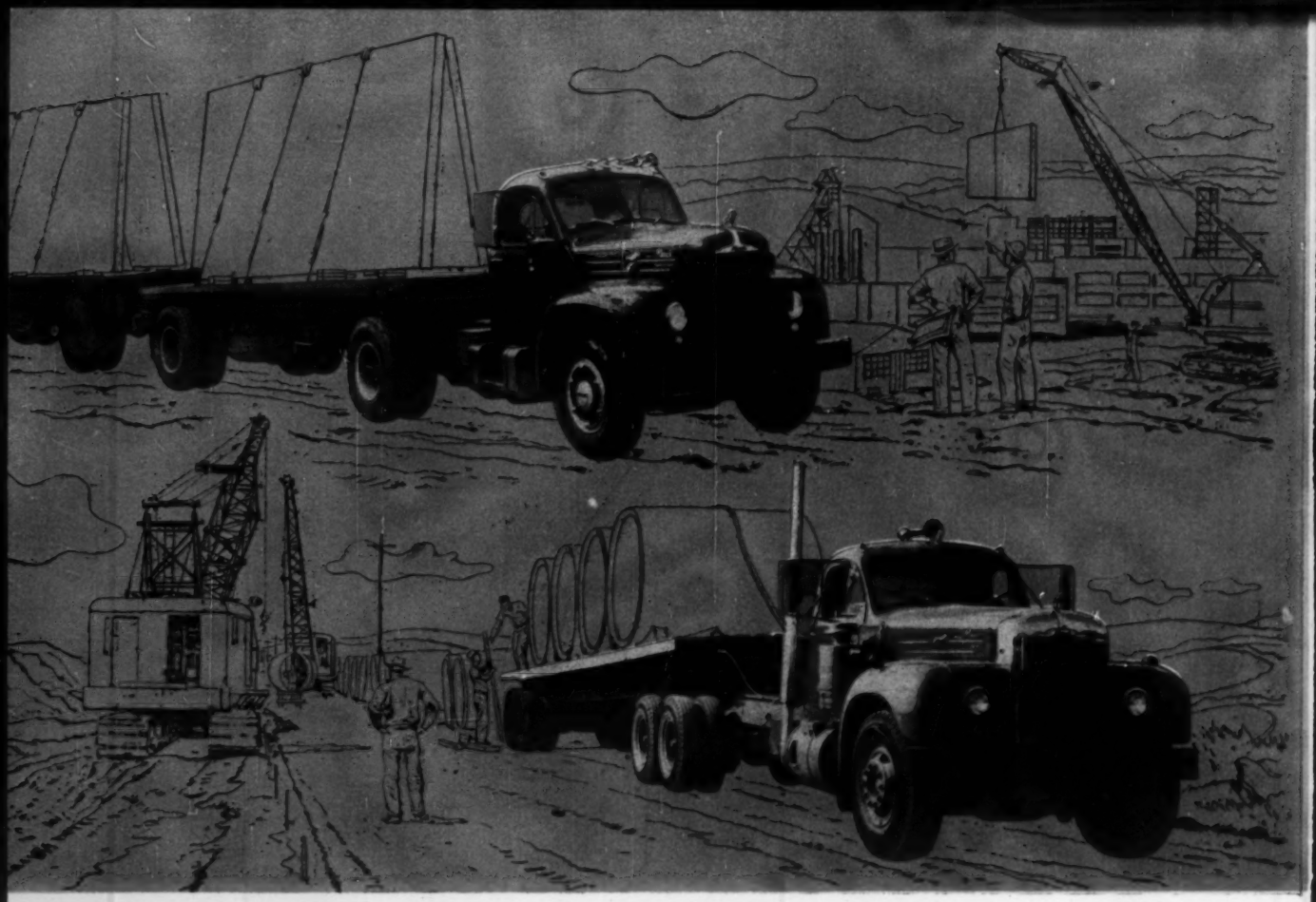
STEERING: 60° turning circle diameter.

DUMP HOIST: Twin, double-acting, 8" cylinders providing 70° dumping angle.

MACK MODEL LRX

The 15-ton LRX offers outstanding maneuverability with off-highway stamina and capacity. Powered with either a Mack or Cummins diesel engine and equipped with a Mack ten-speed transmission and Planidrive rear axle assembly, the LRX is an efficient performer on long hauls as well as steep grades. Powerful air brakes, carefully engineered cab, and rugged unified frame assembly have long made the LRX a popular model for earth or rock hauling.

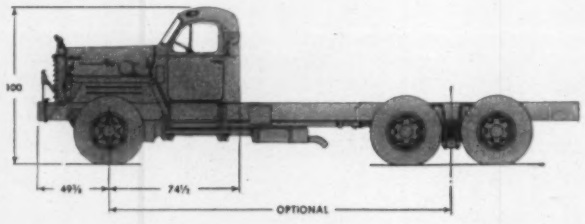
For capacities of 30 tons or more where maximum flotation is required, a full line of tandem rear axle Macks is available.



MACKS FOR EVERY

MACK B-80 SERIES

B-80 tractors for heavy-duty flat bed and dump trailer hauling, and B-80 truck chassis for large capacity dumper, mixer, and stake body operations have run up an unequaled record for economy and dependable service in all phases of construction work. Available in four- and six-wheel models including six-wheel drive models, B-80's are powered with 170 to 232 horsepower Mack Thermodyne gasoline or diesel engines, or with Cummins diesels in the 220 to 320 horsepower class.



CONDENSED SPECIFICATIONS

PAYLOADS: Rear dumper, 6 to 12 cubic yards; mixer, 7½ to 8½ cubic yards (6-wheelers) (larger with special provision).

ENGINES: Gasoline: Mack Thermodyne, 232 h.p. Diesel: Mack Thermodyne, 170 h.p.; 205 h.p., with turbocharger. Cummins, 220 h.p.; 320 h.p., with supercharger.

TRANSMISSIONS: Mack: Five-speed, direct or overgear. Ten-speed (two-lever) Duplex. Twenty-speed Quadruplex. Five-speed and auxiliary, with or without tower power take-off. Availability contingent upon chassis models.

FRONT AXLE: Mack, heavy-duty, drop-forged I-beam. Mack, front wheel drive, for 6x6 chassis.

REAR AXLES: Four-wheelers: Mack Dual Reduction, with radius rods and torque arms. Six-wheelers: Mack Balanced Bogie, Dual Reduction, through-drive, interaxle Mack Power Divider.

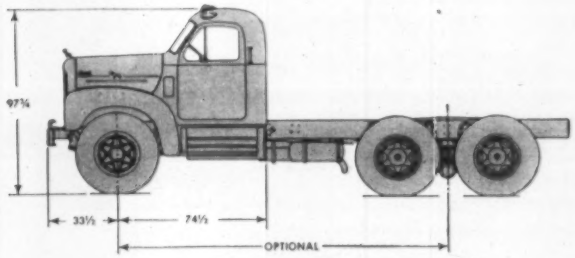
FRAME: Channel: Alloy-steel, heat-treated; channel reinforcement, standard.

TIRES: Available sizes and types: 11.00-24, 12.00-24 (Four-wheeler); 11.00-22, 11.00-24, 12.00-24 (Six-wheeler). Size availability contingent upon bogie.

STEERING: Hydraulic-power steering (optional extra).

CONSTRUCTION JOB

aggregate and materials hauling



CONDENSED SPECIFICATIONS

PAYLOADS: Rear dump, 6 to 12 cubic yards; mixer, 5½ to 7½ cubic yards (6-wheelers).

ENGINES: Gasoline: Mack Thermodyne, 185 h.p. Diesel: Mack Thermodyne, 170 h.p.; 205 h.p. with turbocharger.

TRANSMISSIONS: Mack: Five-speed, direct. Ten-speed (two-lever) Duplex. Twenty-speed Quadruplex. Ten- and twenty-speeds both "On" and "Off" Highway types. Five-speed and auxiliary, with or without tower power take-off; ten-speed and auxiliary. Availability contingent upon chassis models.

FRONT AXLES: Mack, heavy-duty, drop-forged I-beam. Three available sizes.

REAR AXLES: Four-wheelers: Mack Dual Reduction—with radius rods and torque arms. Six-wheelers: Mack Balanced Bogie, Dual Reduction, through-drive, interaxle Mack Power Divider. Three bogie sizes available.

FRAME: Channel: Alloy-steel, heat-treated, pressed; channel reinforcements for maximum services (standard or optional extra).

TIRES: Available sizes and types: 11.00-24, 12.00-24 (Four-wheeler). 10.00-20, 10.00-22, 11.00-20, 11.00-22, 11.00-24 (Six-wheeler). Size availability contingent upon bogies required.

STEERING: Hydraulic-power type (optional extra).

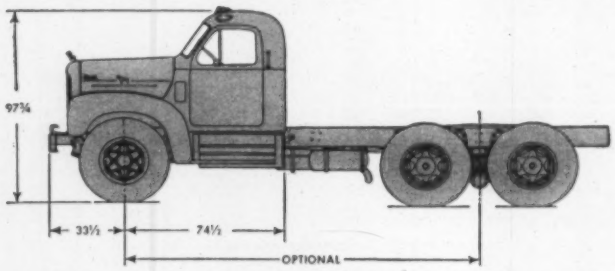
MACK B-60 SERIES

As dumpers, mixers, tractors, and flat-bed trucks, Mack B-60's are the acknowledged workhorses of contractors everywhere because of their dependable and efficient performance for a wide range of jobs. They are powered with Mack Thermodyne gasoline or diesel engines in either the 170 or 205 horsepower range. Both four- and six-wheel units are available. Six-wheel models use the exclusive Mack Balanced Bogie with interaxle Power Divider, the sure-footed drive that directs power more to the wheels having the greater traction.

MACKS FOR EVERY

MACK B-40 SERIES

Available in four- and six-wheel models including six-wheel drive models, the B-40 series, slightly smaller than the B-60's, is especially valued for its bonus capacities, handling ease, and economical operation. B-40 dumpers, tractors, mixers, and flat-bed trucks use either Mack 150-horsepower Thermodyne diesel or Magnadyne gasoline engines. Like all Macks, the B-40 series is engineered and built with precision and thoroughness . . . your assurance of dependable and cost-saving operation.



CONDENSED SPECIFICATIONS

PAYLOADS: Rear dumper, 5 to 10 cubic yards; mixer, 5½ to 6 cubic yards (6-wheeler).

ENGINES: Gasoline: Mack Magnadyne, 150 h.p. Diesel: Mack Thermodyne, 150 h.p.

TRANSMISSIONS: Mack: Five-speed, direct. Ten-speed (two-lever) Duplex. Twenty-speed Quadruplex. Ten- and twenty-speeds, both "On" and "Off" Highway types. Five-speed and auxiliary, with or without tower power take-off. Availability contingent upon chassis models.

FRONT AXLES: Mack, heavy-duty, drop-forged I-beam. Four sizes. Mack, front-wheel drive (for 6x6 chassis).

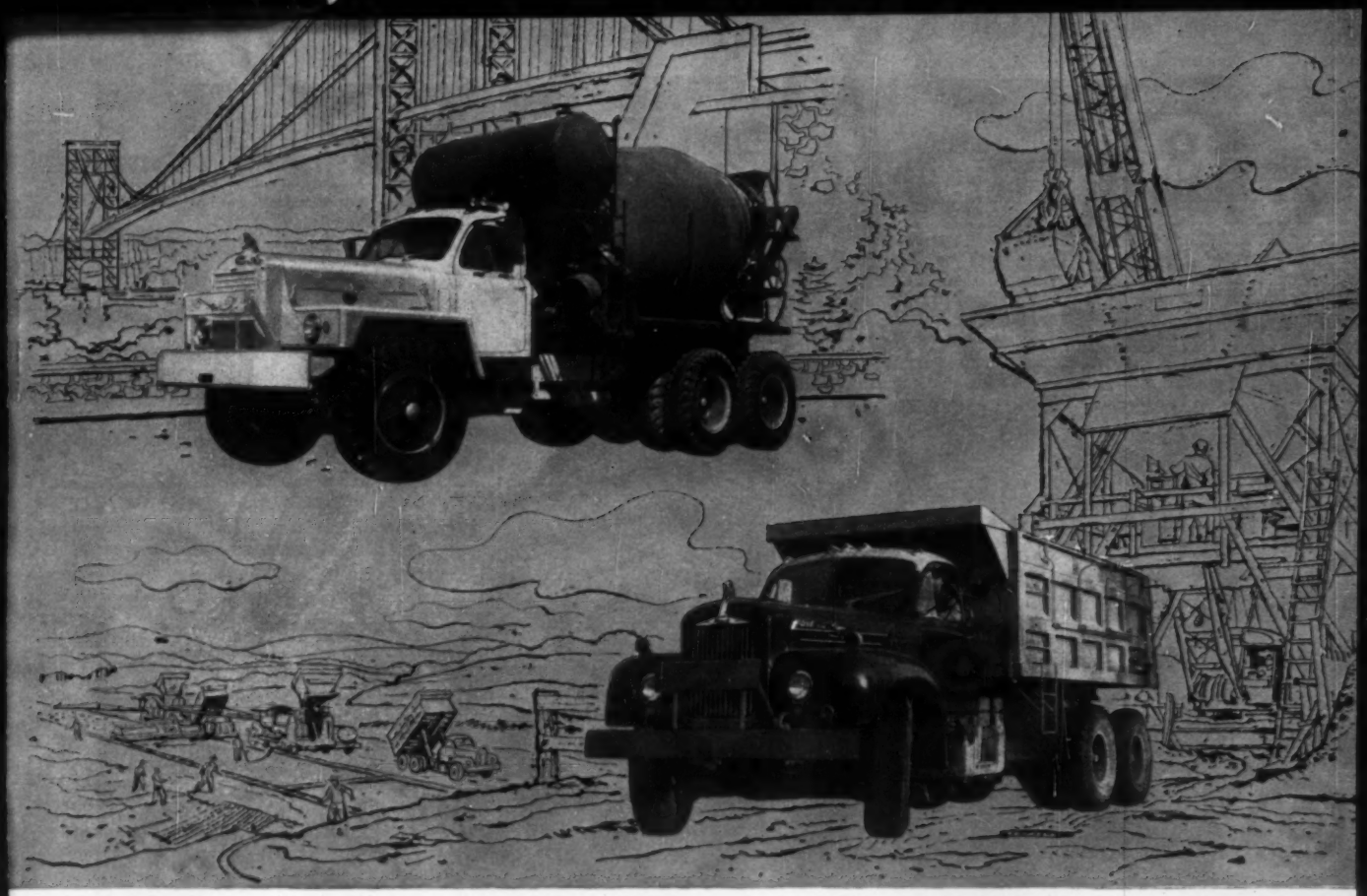
REAR AXLES: Four-wheelers: Mack Dual Reduction. Six-wheeler Bogie: Mack Balanced Bogie, Dual Reduction, through-drive, inter-axle Mack Power Divider.

FRAME: Channel: Alloy-steel, heat-treated, pressed; appropriate inside channel reinforcement (standard or optional extra).

TIRES: Available sizes and types: 10.00-20, 11.00-20, 11.00-22 (Four-wheeler). 8.25-20, 9.00-20, 10.00-20, 10.00-22, 11.00-20 (Six-wheeler). Availability contingent upon chassis.

STEERING: Hydraulic power steering (optional extra).

Illustrations are not necessarily representative of standard specifications.



CONSTRUCTION JOB

concrete, dry-mix, and asphalt hauling

ONLY MACK OFFERS ALL THESE PROFIT-POWER FEATURES

A truck or tractor for every construction job. Dumpers, concrete mixers, tractors, flat-bed trucks—there are dependable, economical Macks for every important construction task . . . right up to the biggest. Moreover, when you standardize on Macks, you gain the added savings of a completely integrated parts and upkeep operation.

Widest choice of engines. To meet your needs exactly, Mack offers a choice of proved, dependable engines in every power range: Mack Thermodyne® diesel or Mack gasoline engines at 150 h.p. . . . Mack Thermodyne diesel, Mack gasoline or Cummins diesel units in the 170-232 h.p. range . . . and Cummins diesels from 250 to 450 h.p.

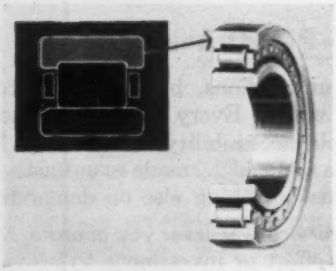
Unequaled performance and economy. Every Mack is fashioned from the finest, most durable materials . . . crafted to the highest standards of strength, stamina and precision in the industry. Mack controls this quality by making more of its own major components—engines, clutches, brakes, transmissions, bogies, cabs, etc.—than any other maker. Every Mack is engineered for fast, simple accessibility. And every Mack is "Built like a Mack"... made to outlast, outwork, and outearn anything else on demanding jobs.

Parts and service wherever you operate. Mack has spared no effort or investment to provide every Mack owner—everywhere—with the fullest parts-and-service coverage. There is a Mack branch or distributor close to your job who carries *nearly* any part you'll need on the job . . . and behind them are Mack parts depots that can ship out *any* replacement part at a moment's notice.

MACK
first name for
TRUCKS

Mack Trucks, Inc., Plainfield, New Jersey
In Canada: Mack Trucks of Canada, Ltd.

Loggers' "weight-lifter" tests bearing stamina!



TWO-LIP RACE INCREASES RIGIDITY

Two parallel shoulders made integral with the outer race, as shown in gray above, increase rigidity and durability —keep rollers in proper alignment. Precision-ground rollers and races give quieter, smoother operation.

Tossing around logs 6 feet in diameter like toothpicks is no job for a softie! This machine has to be *built* for it right from the start—*right down to the bearings.* And that goes, too, for the trucks which haul these back-breaking giants over the most rugged terrain. Bower tapered and straight roller bearings have been *engineered* for just such work as this—to last longer, perform better under any road or load condition. Painstaking quality control plus basic bearing design refinements—like those shown at left—have reduced Bower Bearing failure to a practical minimum. *Whatever* your product, if it uses bearings, specify Bower! There's a complete line of tapered, straight and journal roller bearings for every field of transportation and industry.

BOWER ROLLER BEARING DIVISION
FEDERAL-MOGUL-BOWER BEARINGS, INC. • DETROIT 14, MICHIGAN

BOWER ROLLER BEARINGS

Reader Comment

U. S. Help in Lebanon

SIR—In ENR July 24, p. 25, under the heading ". . . And in Lebanon," you make the statement that "other American engineers have not been active there since a Bureau of Reclamation group did preliminary design for a dam and tunnel project to utilize the water of the Litani River, etc."

To clarify any misunderstanding that may exist regarding the use of engineering personnel, the following comments are pertinent. In addition to the Litani River investigation, a Bureau of Reclamation team has just completed reconnaissance reports on nine river basins in Lebanon. They have also assisted the government of Lebanon in the preparation of plans and supervision of the construction of various public works programs.

In the last four years ICA engineers have been active in the water supply field, having already had a hand in the construction of water systems for over 200 villages and the construction of Kasmie Irrigation Project. Since September, 1957, Malcolm Pirnie Engineers, New York City, has been designing water supply under its ICA contract, after completing the design of sewers for the city of Tripoli, Lebanon.

Under a similar ICA contract Miner & Miner Consulting Engineers, Inc., Greeley, Colo., has been designing a rural electrification system which will eventually blanket the whole country. The Bureau of Public Roads is also supplying a staff of highway engineers to ICA to assist the government of Lebanon in an over-all highway development program.

It is realized that comparative to the programs of larger countries the engineering work is rather insignificant, but to a small country like Lebanon the engineering assistance furnished by ICA has greatly facilitated the development of the country.

HAROLD H. WEILAND, CHIEF
Public Works Division
U. S. Operations Mission to Lebanon
Beirut, Lebanon

(*Reader Comment continued page 12*)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

KERRIGAN Weldforged TRADEMARK

Open Steel DRAIN GRATES

for THRUWAY—HIGHWAY and STREET CATCH BASINS

TRENCH COVERS

for AIRPORT HANGARS—DRIVEWAYS—INDUSTRIAL PLANTS

- Strong—Non-Cracking—Durable Steel
- Fast Draining—Non Clog
- Self Cleaning
- Light-weight—Easy Installation
- Economical

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Middle-East New Look Needed?

Sir—I read with a great deal of interest your feature article entitled "Foreign Aid: New Look Needed?" (ENR July 31, p. 21). It does appear that a new look is needed.

Our basic problem is that the Administration, having lost touch with the aspirations of the indigenous peoples concerned, believes it can stop communism by billing Uncle Sam as the "bountiful." This is not possible. In considering the Middle East, let us ask what the average Arab, who is rather poor, wants.

I believe that we might as well accept the fact that the Arab, whose spokesman and hero is apparently Nasser, wants: his world to regain the greatness it had in the days of Saladin; uniting of the region which means the obliteration of the boundaries established by the colonial powers; the downfall of the Pashas and Sheiks who generally stand for hereditary political, economic, and legal privileges; eventual control of the oil, which implies a much greater share in profits; and the destruction of Israel.

Russia is quite prepared to applaud all these demands since their realization can only hurt the West. Therefore, with little economic aid, she becomes the "Defender" of the Arabs. The Free World also had better become more sympathetic. If not, when we pour dollars into these lands the Arab will say "Yes, it serves to enhance the value of this land, but for the privileged class and not for us."

To be sure we cannot give the Arabs all they think they want. With regard to Israel we could not stomach their finishing the job that Hitler began.

It is probable, for the next five years at least, that the Arabs will feel little sympathy with our battle with communism. Instead, they will use the Suez Canal and the oil to win for themselves maximum economic and political advantages. We will have to meet such manipulations with firmness.

The Arab world is changing and the U. S. cannot maintain its interests until it understands the reasons why. In the meantime we create little friendship when we give grants to governments which are not backed by the mass of the citizenry.

DANIEL HELLER
New York, N. Y.

Suez Dredging Holds More Surprises

SIR—Your article "Suez Award Holds Surprises" (ENR Aug. 7, p. 26) contains mis-statements which we as a member of the joint venture awarded the contract feel should be corrected.

To our knowledge it is not the declared policy of Egypt to let contracts only to firms that do not insist on being paid in hard currencies. There were nine bidders on the canal job, and with the exception of one Egyptian firm all other foreign firms required payments in hard currency ranging from 40 to 70%.

The statement that the dredge cutters will be swung into the main channel during the six minute interval between ships of the passing convoy is not correct and very misleading. What we propose to do is to keep the dredges working on the widening portion of the canal during the passage of convoys, and at no time during the period will any part of the dredging plant and swing wires and anchors be permitted to extend into the main channel further than the present eight meter depth. This is a requirement of the Suez Canal Authority.

Special derrick booms attached to the bow of the dredge will enable the dredges to keep swinging anchors within the eight meter limit while the dredge is dredging the widening portion of the canal.

The above scheme is an idea developed by the joint venture and will increase our effective operating time over that of previous dredgers.

However, during the five or six hour interval between convoys we will be allowed to shift the dredge into the main channel and dredge this part to its new project depth.

H. F. SCHOON, *President*
Atlantic Gulf & Pacific Co.
New York, N. Y.

Water Diversion Dispute

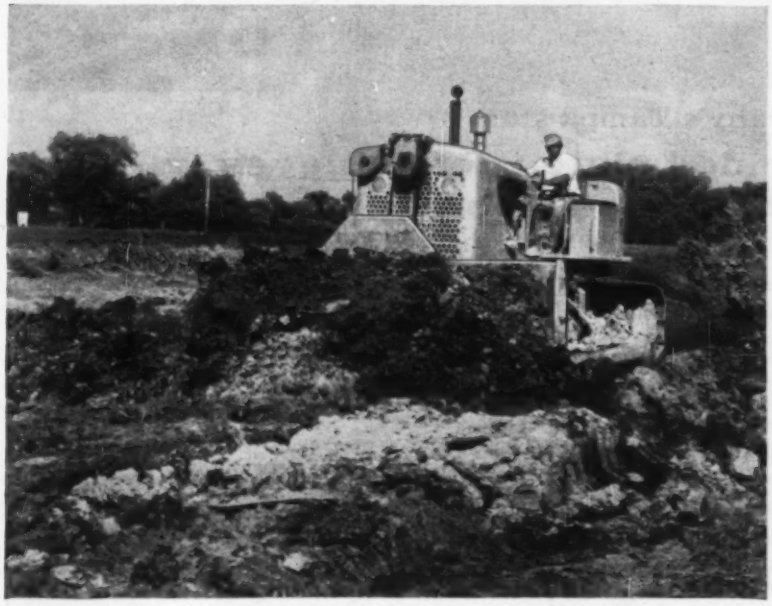
SIR—You may be interested to know that water rights are in litigation for the proposed Calleguas Project in California ("$72 Million Water Plan Will Be Recommended," ENR Aug. 7, p. 48). The Calleguas Project is being opposed by the United Water Conservation District of Ventura County, from whose watershed area water for the proposed project would be exported.

If the Bureau of Reclamation takes a stand in this case consistent with its

His Allis-Chalmers "Dozers" spearhead levee job

Sweetman Construction Co. is building a levee near Sioux Falls, South Dakota—moving nearly one million yards of earth to end costly spring flooding of the Sioux river. Supt. William Bruhn and his spread of Allis-Chalmers HD-16 tractor-dozers spearhead the job. Bill and his operators think highly of the HD-16's. After months of heavy dozing, the tractors maintained a perfect "stay-on-the-job" record.

William Bruhn, Supt.
Sweetman Construction Co.
Sioux Falls, South Dakota



Allis-Chalmers tractor-dozer grades fill on levee. With hydraulic-controlled steering, the big, sure-footed HD-16 handles easily in heaviest material.

148-hp HD-16's handle big-tractor jobs with ease

The two-mile Sioux Falls levee job involves straightening and deepening the river bed—actually shifting the channel three quarters of a mile. Nearly one million yards of earth will be moved to excavate the channel and build the embankment.

Dependable Allis-Chalmers HD-16 tractor-dozers are spreading scraper-hauled fill, heaping muck for the dragline, leveling haul routes—setting a fast pace for other machines wherever they work.

Hydraulic steering a big help

Operators like the way they handle—the sure "feel" of the controls. Hydraulic-controlled steering takes the hard work out of maneuvering, even in the toughest dozing.

The HD-16's big, 148-hp Allis-Chalmers diesel engine delivers plenty of torque to lug through on heavy dozing—lively performance under all job conditions.

Easy servicing pays dividends

Like all Allis-Chalmers crawler tractors, the HD-16 requires lubrication *only once every 1,000 hours* for truck wheels, idlers and support rollers. This means a bonus of hundreds of production hours—a feature that pays dividends on anybody's job.

See what this great tractor can do for you! Six models to fit your needs. 148-hp, all-gear drive, 150-hp with hydraulic torque converter. Bare weight is approximately 33,000 lb. Ask your Allis-Chalmers dealer to demonstrate on your job. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

Look ahead... *move ahead* ...and stay ahead with **ALLIS-CHALMERS**

WHEN AMERICA BUILDS FOR ECONOMY . . . IT BUILDS WITH CONCRETE

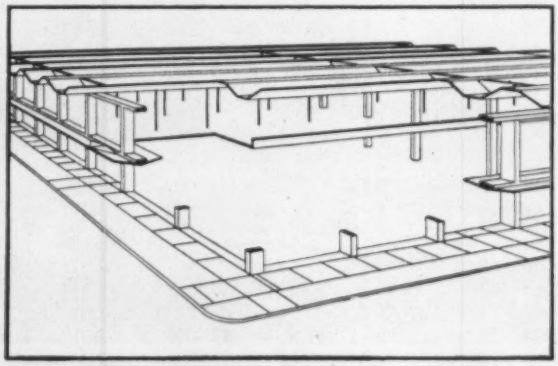
Sears, Roebuck & Company's Tampa store . . .

concrete folded plate roof achieves large, unobstructed floor area

One of the basic requirements here was to achieve unobstructed floor space with economy. Architects Weed, Russell, Johnson & Associates found the answer by using a concrete shell in the form of a folded plate. This construction made it possible to span the entire floor area with only one interior row of columns . . . and suspend the second floor from the roof. The result: 163,715 square feet of *fully flexible* floor space, so important to any retail selling operation.

Folded plate design is, in itself, unique and interesting. And only concrete can give the added boldness of the wide, cantilevered overhang.

It's one more example of the way new uses of concrete are bringing big economies and added vitality to both conventional and modern architecture.



Isometric view showing 125-foot c on c spacing of main columns. Floor slab is supported by 3-inch plates welded together to form a hanger. Hangers are spaced 25 feet c on c.

FOR STRUCTURES... MODERN **concrete**

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A national organization to improve and extend the uses of concrete

NEVER OVERLOOK ESSENTIAL BOUNDARY and ILLUMINATING LIGHTS IN HAZARD WARNING SAFETY

By actual test, the brightest, most revealing of all hazard lights, Dietz Flare Torches fully illuminate the danger in any weather: fog, rain, sleet, snow and wind — the stronger it blows the brighter the flame. Weather-proof, rugged and tough, they give up to 40 hours of clear, bright flame from low-cost kerosene.

Use Dietz Flare Torches to show what the hazard is.

ADEQUATE LIGHTING may save you thousands in tragedies, bad publicity and law suits. Write for our latest authoritative manual on Hazard Warning Lighting. It's free. R. E. Dietz Co., 114 Leavenworth Ave., Syracuse, N. Y.

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Dietz Visi-flash warning lights are the brightest, safest, most trouble-free flashers on the market. They give far-carrying warning that can be seen from either direction, and over wide angles. The Dietz Visi-flash warns, "danger ahead."

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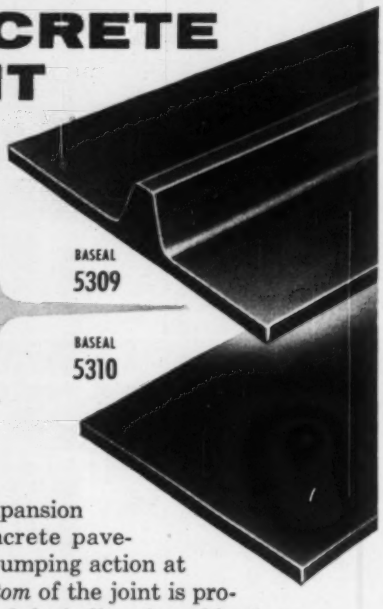
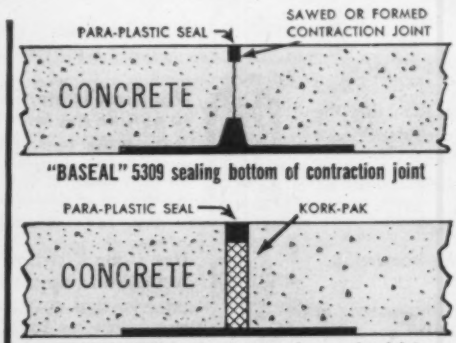


For maximum protection of expansion and contraction joints in concrete pavement, and the elimination of pumping action at joint intervals, be sure the *bottom* of the joint is protected against water seepage and the infiltration of foreign materials. Specify Servicised "BASEAL"—a resilient rubber base plate for expansion and contraction joints—made in two types, specifically designed for optimum performance and joint protection. "BASEAL" provides long-time protection because it is an extremely stable rubber compound, resistant to deterioration caused by fungus growth, etc.

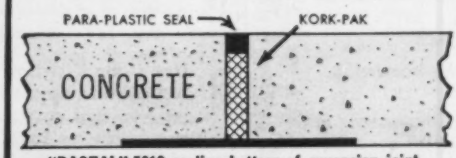
Installation is simple. "BASEAL" is merely placed over the compacted pavement base prior to paving. Due to its resilient characteristics, the material will conform to the terrain after concrete is poured.

"BASEAL" is available in continuous lengths of 26 feet. Standard width is 6 inches.

Drawings at right show Servicised "BASEAL" in place in expansion and contraction joints.



"BASEAL" 5309 sealing bottom of contraction joint



"BASEAL" 5310 sealing bottom of expansion joint

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. . . Reader Comment

stand in regard to the waters of the Colorado River, then it will not recommend this project while the water rights are in controversy.

William P. Price, Jr.
General Manager and Chief Engineer
United Water Conservation District
Santa Paula, Calif.

Buttress Dam Credit

Editor's Note: On page 31 of the September 11 issue, it was stated that "Carlo Semenza of Italy has led the way in the development of the modern hollow buttress dam." Actually, Dr. Semenza has done little in the field of buttress dams, owing to the lack of favorable site conditions on his projects for this type of structure. It is Dr. Claudio Marcello of Italy who should be credited with having "led the way in the development of the modern buttress dam." He has designed and supervised the construction of 13 dams of this type in Italy and abroad.

Too Much Fiesta

Sir—The new San Juan Sewage Treatment Plant, dedicated May 20 as part of the activities of the VI Congress of AIDIS, is not "Puerto Rico's first sewage treatment plant" (ENR June 19, p. 138) but the fifteenth.

Since 1945, when this Authority took over all Puerto Rican water and sewer works which had been until then under municipal management, we have expended over $21 million in sewer works, which include construction of 22 new sewerage systems and improvements to existing ones.

Rafael M. Palmer
Acting Executive Director
Puerto Rico Aqueduct & Sewer Authority
San Juan, P. R.

EDITOR'S NOTE: The plentiful fiesta at the AIDIS Congress must have further confused ENR's correspondent. The San Juan plant was described as a secondary facility when actually it is a primary plant.

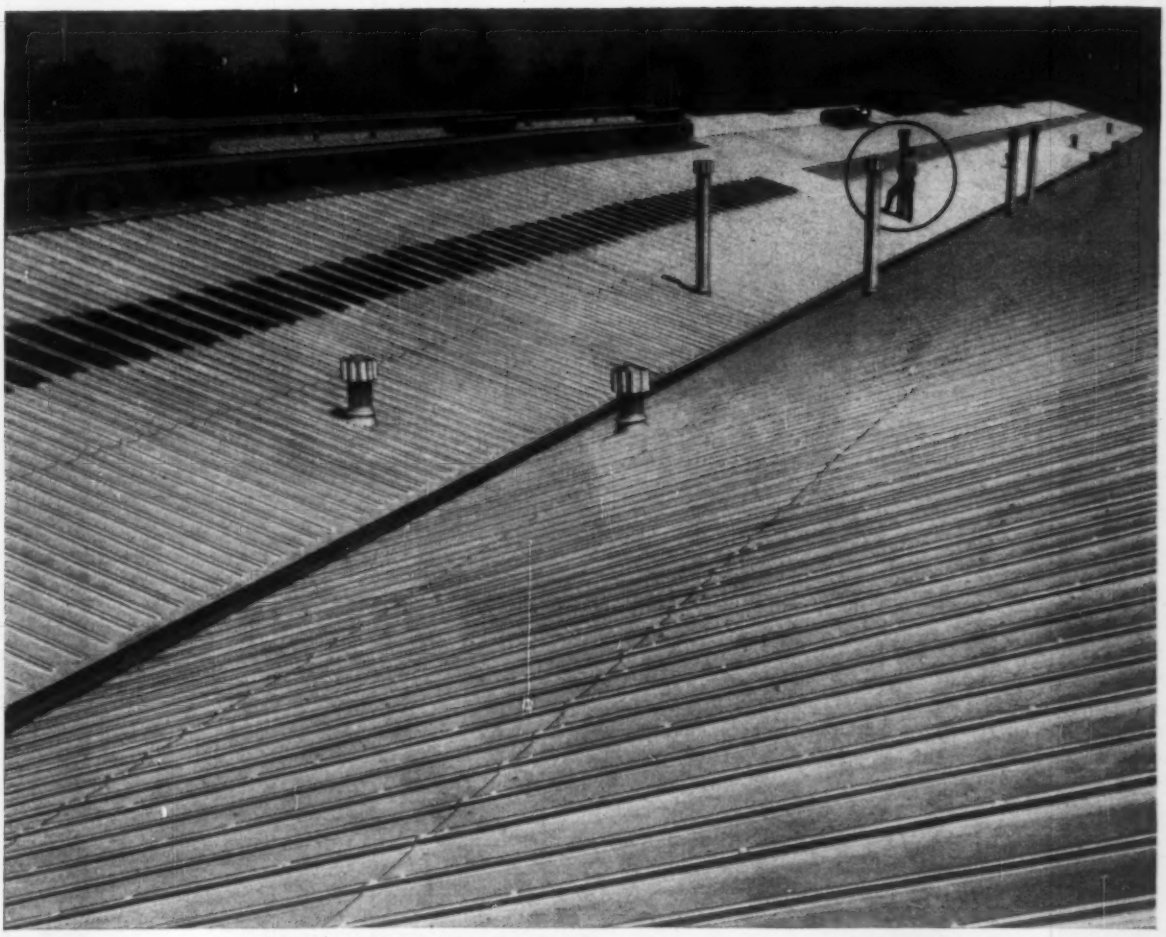
CALENDAR

American Public Works Association, public works congress and equipment show. Municipal Auditorium and Hotel Muehlebach, Kansas City, Mo., Sept. 28-Oct. 1.

Federation of Sewage and Industrial Wastes Associations, annual meeting, Sheraton-Cadillac Hotel, Detroit, Mich., October 6-9.

National Society of Professional Engineers, fall meeting, St. Francis Hotel, San Francisco, Calif., Oct. 23-25.

American Concrete Institute, regional meeting and headquarters dedication, Statler Hilton Hotel, Detroit, Oct. 27-28.



FIVE-ACRE ALUMINUM ROOF YIELDS BIG MAINTENANCE SAVINGS

Butler Manufacturing Company builds for AMF with Alcoa Aluminum

To eliminate expensive yearly maintenance and repair, one of American Machine and Foundry Company's newest plants is completely roofed with corrosion-resistant Alcoa® Aluminum. The entire facility, built in conjunction with the Arkansas Industrial Development Committee, houses AMF's bicycle manufacturing operation.

This Butler High Rib Roof Panel of Alcoa Aluminum also reflects the sun's heat to keep the interior as much as 15 per cent cooler in the summer. Aluminum's heat reflecting characteristics help reduce air-conditioning loads as well as heating costs. Lightweight, easy-to-work-with aluminum goes up faster with less man power and requires less expensive frames and foundations.

Get Complete Facts on aluminum roofing and siding materials and their application to industrial buildings, warehouses, laboratories and utility structures. Contact your nearest Alcoa sales office, or write Aluminum Company of America, 860-J Alcoa Building, Pittsburgh 19, Pennsylvania.

Building:
American Machine and Foundry Company, Cycle Division, Little Rock, Ark.

Engineers and Builders:
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Whether it be shining shoes, or a multi-million dollar industry, operational costs can spell the difference between success and failure. That is why so many government agencies, municipalities, private water companies, and industries have turned to LOCK JOINT CONCRETE PRESSURE PIPE.

The dense walls of Lock Joint Concrete Pressure Pipe resist electrolysis and soil corrosion. They also protect steel reinforcing of such conservative stress design that danger of bursting is virtually negligible. Result: replacement or even repair is a rarity, and danger of sudden failure which often entails extensive damage is held to a minimum.

Smooth concrete inner surfaces which cannot tuberculate make the pipe's initial high carrying capacity permanent. Result: low pumping costs and full capacity in the future when even greater demands may be made on the line.

Long life, permanent high carrying capacity and minimal maintenance represent highest quality service at lowest operational cost. This measure of a successful water works system can be yours with LOCK JOINT CONCRETE PRESSURE PIPE.

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ENGINEERING NEWS-RECORD

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CONTENTS

NATIONAL AFFAIRS

Heightening of Dams Is Big Future Job..... 23
The Most Beautiful Bridges..... 26
Sixth Missouri Dam Is Planned..... 28
Fish Cause Western Dispute..... 28
Aluminum-Girder Bridge Opened to Traffic.... 32
New University Slated for Florida..... 32

FEATURES

How Long Will This Primary Plant Do?..... 34
11 Interstate Miles Designed in 16 Weeks..... 42
Construction Spotlight Shifts to Iran..... 51

INTERNATIONAL

Flood Alarm Guards New Zealand Bridge..... 65
Oil Firms Spur Venezuelan Construction..... 65
India, China Studying World's Largest Hydro... 66
Canada Builds Roads to Exploit Resources..... 66

NEW PRODUCTS

New Scraper Is World's Biggest..... 69
Drive Wheels Tie to Traction Booster..... 70
Bearing Pad Slides Used as Insulator..... 70
Tamper Packs Earth, Black-Top..... 72

MEN AND JOBS

Moreell to Retire as J&L Chairman..... 75
Engineer Replaced as Road Commissioner..... 75

BUSINESS AND FINANCE

Will the Apartment Boom Last?..... 107
"Buy American" Federal Ban Coming?..... 109
Commercial Work Heads Higher..... 109

LABOR

Teamster Chief Bids for Freedom..... 110
Open-Shop Setback for Unions..... 111

Reader Comment ... 11
Calendar 16
Washington Observer 21
Obituaries 78
Unit Prices 82
Materials Prices 83
Construction Reports. 84
Statistics, Indexes... 102
Editorials 124

Back Issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Semi-annual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

BOOST FOR MEDIUM-RENTALS—Two low-rent projects originally planned for New York City's lower east side will be replaced by two medium-rent public housing developments. The New York City Housing Authority made the change following demands by community and business organizations that sought to avoid economic stratification of the area. The building designs will be revised from 2,190 lower-rent apartments to 1,975 medium-rent units. Formerly both developments were to be subsidized by the federal government. Now they'll be sponsored by the city. (For more on apartment construction, see p. 107.)

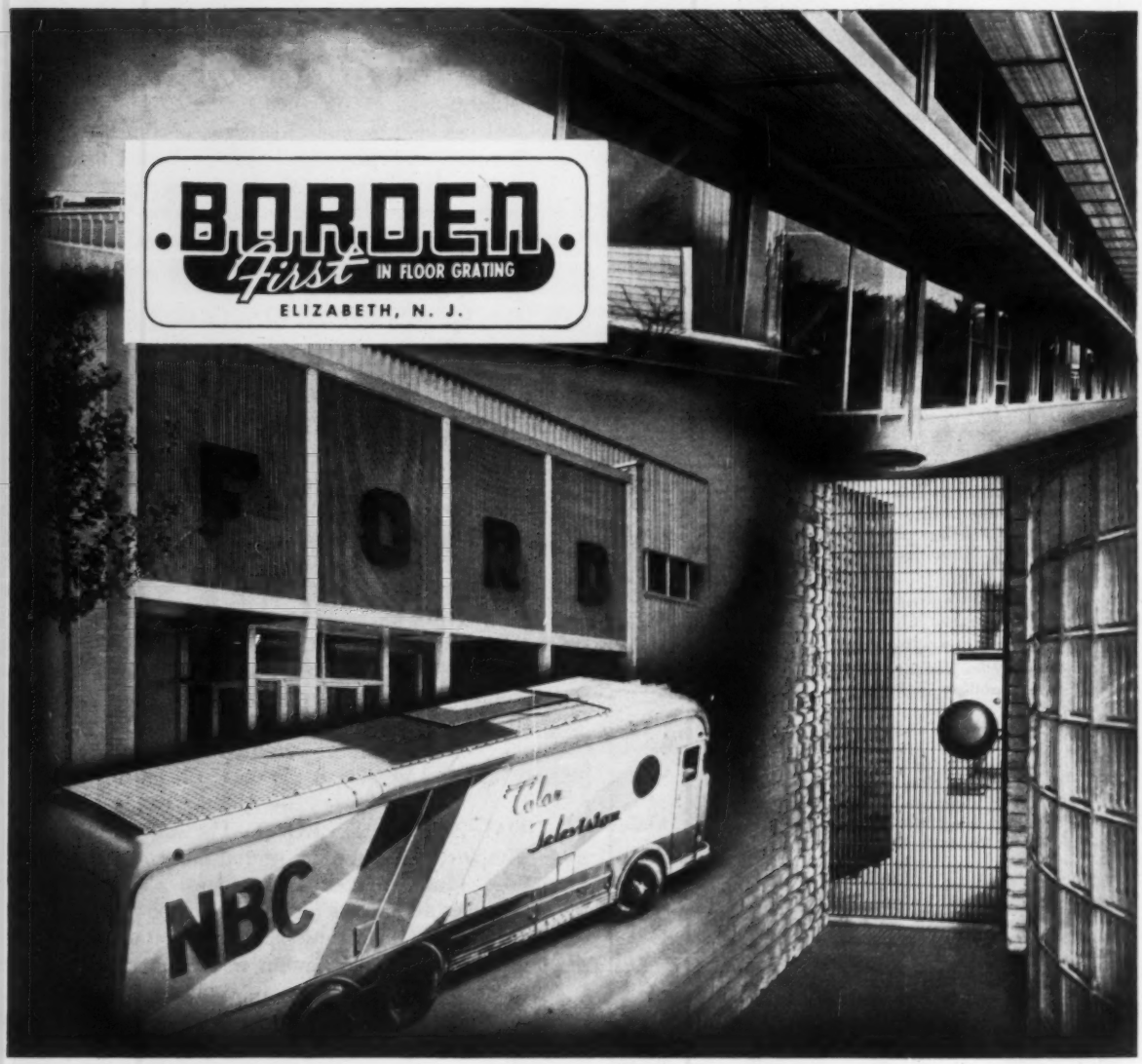
BIGGEST COLUMN BASE?—Superstructure work began last week at Chase Manhattan Bank's $120 million headquarters project in New York City. First member placed was a 40½ ton column base, believed to be the heaviest ever assembled. Over 50,000 tons of steel will be used in the 820 ft building. Bethlehem Steel Co. is the steel contractor.

LET THE STATE DO IT—New York's Westchester County parkways badly need modernization but the county can't afford it. So a plan is being devised to transfer 70 miles of road to the state for redevelopment and operation. The parkways cost $65 million, with $18.3 million of the debt still unpaid.

GOAL: A UNITED FRONT—The Allied Construction Employees Association, central labor relations agency for Milwaukee contractor groups, plans to expel a member association for signing a labor agreement on terms other than those approved by the Allied Association. The allied group was trying to keep 1958 wage increases down to 10 cents an hour. But the Southern Wisconsin Asbestos Contractors Association went its own way and signed a contract for an immediate pay boost of 20 cents.

MORE TROUBLE AT VANCOUVER—Strikes in eastern Canadian steel mills are expected to hold up work for at least two months on the Second Narrows Bridge in Vancouver, B. C. This will make the June 1959, completion date a "tight prospect," says Dominion Bridge Co. engineers. Previously, tragedy struck in June, when a temporary bent buckled and two spans collapsed on the partly completed bridge, killing 18 men (ENR June 26, p. 21). The accident damaged the company's 110 ton traveling crane and a 35 ton derrick. Now, the strikes have cut off supplies of special alloy steel parts needed to repair the rigs. Meanwhile, recovery of steel from the collapsed sections is going on.

DEEPER CUTS—Another $24 million must be cut from Florida's $700 million pay-as-you-go construction program. Last May's $29 million reduction is not covering the slump in sales tax revenue.



New Uses for Aluminum Grating

Here . . . new applications for aluminum grating . . . exacting installations where quality equal only to BORDEN'S will do:

1 BORDEN pressure-locked aluminum grating used for maintenance-free fencing at J. L. Hudson's Northland Shoping Center, Detroit, Michigan.

2 Sunshades of BORDEN pressure-locked aluminum grating permit passage of light and air while screening strong sunlight at Mooseheart High School, Mooseheart, Illinois.

3 Large panels of BORDEN pressure-locked aluminum grating support company name over entrance of Lima, Ohio Ford Motor Company engine plant.

4 BORDEN riveted aluminum grating provides strong, safe footing for cameramen atop this NBC color television truck.

5 Unusual door of BORDEN pressure-locked aluminum grating at service entrance to the Florsheim residence in Chicago, Illinois.

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PLANTS AT: LEEDS, ALABAMA; UNION, N. J.; CONROE, TEXAS; BEETON, ONTARIO, CANADA

WASHINGTON OBSERVER

- Quick action needed for highway funds
- Pentagon reverses "Buy American" stand

• **Congress will tackle highway financing early next session.** Leaders agree that an impending deficit in the highway trust fund, which is fed by taxes on users, makes quick action next year necessary.

The pay-as-you-go rider (the Byrd Amendment) will probably be waived, again. The rider limits federal-aid payments from the fund to total revenues from items such as gasoline and tires. It was suspended last spring for two years in the emergency highway legislation. Now Congressional observers believe the suspension will be voted beyond fiscal 1961—perhaps even permanently.

Highway trust fund financing will be examined, with an eye to overhauling, to make sure that there is enough money in the till to pay for construction needs. If the tax burden on users looks too great, most Congressional observers believe Congress will decide to cover the deficit from general appropriations.

The House Ways and Means Committee, headed by Rep. Wilber Mills (D., Ark.), plans to look into the trust fund early in the session.

Unless Congress lifts the pay-as-you-go ban, allocations for fiscal 1961, which will be made next year, would drop from an authorized $2.8 billion to $2.1 billion.

Experts now see the need for an extra $1 billion in income, from user taxes or appropriations, to complete the program over 13 years of construction, and 16 years of user taxing.

Here is their figuring. Rising costs of the interstate system now are estimated at 37% above original estimates. A step-up in the primary, secondary and urban federal-aid allocations will bring spending in those programs to a $1 billion annual rate.

On the revenue side, the trust fund is expected to have an accumulated deficit of nearly $200 million during fiscal 1960. An extra $1 billion will have to come from somewhere, or Congress will have to let the trust fund go in the red.

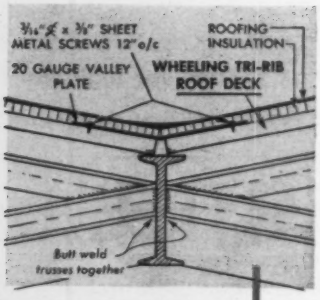
A third choice is reducing highway construction, which no one in Washington now wants to do.

The Administration is expected to ask for user tax increases next year, say, perhaps one cent a gallon on gasoline, higher tariffs on tires, excises and truck licenses. Congress may balk at imposing all the increases necessary to put the fund in balance. Some deficits, or supplementary appropriations, may be the result.

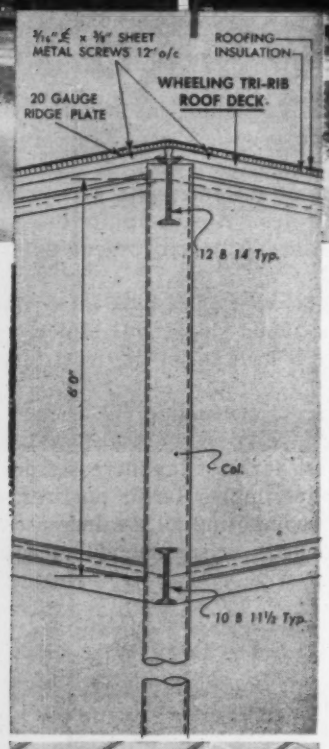
—

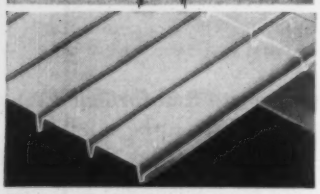
• **The Pentagon has reversed itself on a requirement that foreign bidders must have U. S. or Canadian repair and testing facilities** to be eligible to bid on Corps of Engineers projects (ENR Aug. 14, p. 25). After State Department intervention, the Pentagon ruled that a foreign bidder may contract with a firm here for repair and test work. So, last week English Export & Trading Co., and Legnano Electric Co. of Italy were low bidders on equipment for Fort Peck Dam in Montana. Contracts are not yet awarded. (For more on "Buy American" see p. 109.)

Unique Building Supply Center features roof of quickly installed Tri-Rib Roof Deck


3/16"ø x 3/4" SHEET METAL SCREWS 12" o/c
ROOFING INSULATION
20 GAUGE VALLEY PLATE
WHEELING TRI-RIB ROOF DECK
Butt weld trusses together

Hechinger customers can forget about the weather! Roof, made of Tri-Rib Roof Deck, extends out 15 feet over walks on all sides to serve as an all-weather canopy.





Wheeling Tri-Rib Roof Deck is designed in accordance with specifications adopted by A.I.S.I. Light Gauge Cold-Formed Steel Design Manual 1956 Edition.

Featuring a roof using a series of rhomboid-shaped umbrella trusses joined together and constructed of Wheeling Tri-Rib Roof Deck, the Hechinger Company's Rockville, Md., store is one of the world's most modern building supply centers.

Ideal for many types of construction, Tri-Rib is made of Wheeling Cop-R-Loy® steel – the famous copper-bearing steel that has proved its long-lasting qualities through years of actual field use! And – because Tri-Rib is light and strong – it requires fewer and lighter columns, shallower footings and eliminates the subpurlins required by many other types of roof construction.

On the installation shown above, Mr. Frank Wolfsheimer, president of Hechinger Engineering Corp., builders of the center, reports, "We were very pleased with the way Tri-Rib went on, especially with the speed of installation and the way Tri-Rib and Tri-Rib Accessories are engineered to work so perfectly together."

Find out how Wheeling Tri-Rib Roof Deck can help you, too. See Sweets, or contact our nearest representative. Wheeling Corrugating Company, Wheeling, West Virginia.

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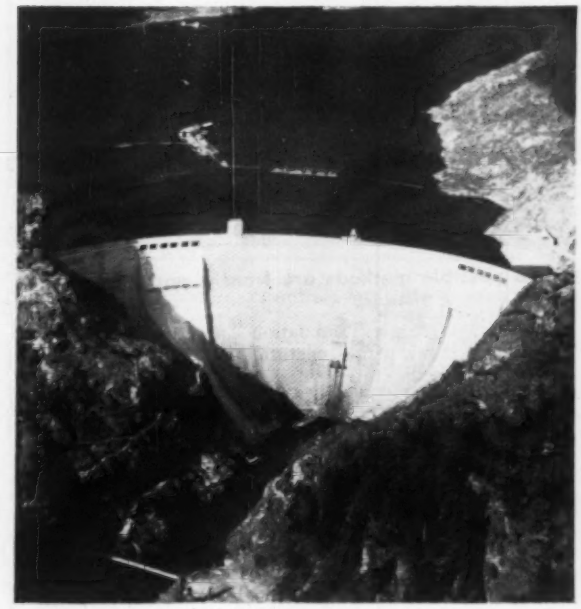
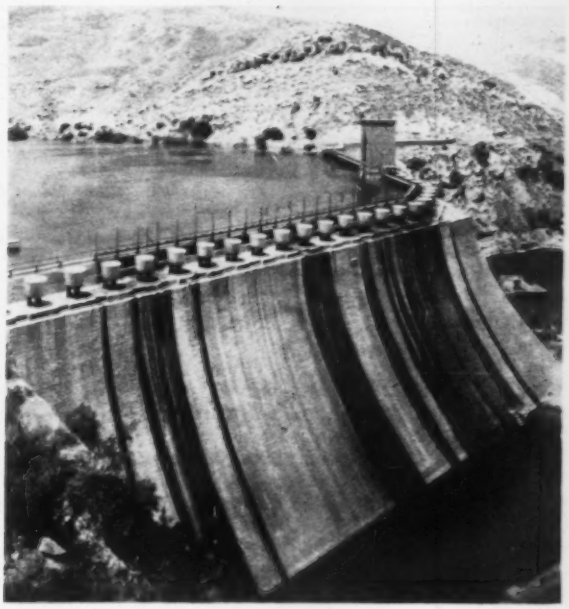


STAGE CONSTRUCTION—Planned heightening is typified by Ross Dam, near Seattle, Wash.



RAISING OLD DAM—Algeria's Cheurfas Dam used tensioned cables for the first time in anchoring addition to the structure.

Heightening of Dams Is Big Future Job

A dominant conclusion to be drawn from the Sixth International Congress on Large Dams, held last week in New York City, is that perfection of dam heightening techniques must be a major new objective of dam designers and builders.

Existing dams occupy many of the better sites; it is often more economical to increase their storage capacity and power head by heightening instead of building a new dam. On the other hand, when new dams are built, the ultimate demand from them may be many years away; it will then frequently be more economical to build them in stages. In either case proved dam heightening techniques will be called for.

Twenty-nine papers from 15 countries were devoted to the subject of dam heightening. But equally absorbing to the registrants at the congress were 120 other papers and discussions focused on three additional questions pertaining to better, more efficient dams:

- Comparison of measured stresses and deformations in dams with computations and with tests on small scale models.
- Compaction methods and moisture content for materials used in earthfills.
- Use of admixtures and pozzolanic materials in concrete and the influence of the finer sand particles.

The proceedings of the congress were confined to discussions of the papers (all of which had been preprinted) and presentation was in either French or English, with simultaneous translation provided through earphones for each member of the audience.

Discussion was initiated by a general reporter, whose presentation analyzed and summarized all the papers devoted to a particular question. These general reporters were Jose Toran Pelaez, of Spain, on dam heightening; Tokujiro Yoshida, of Japan, on stress and deformation comparisons; Ervin Nonveiller, of Yugoslavia, on compaction methods; and Kristen Friis, of Norway, on concrete admixtures, whose presentation was made by his fellow countryman, Christian F. Groner.

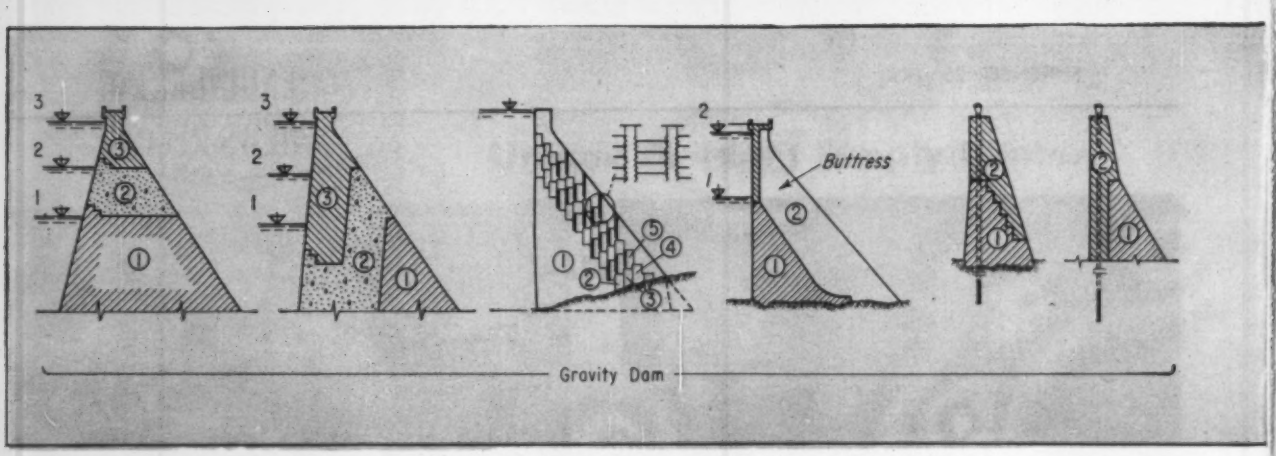
The opening session was presided over by Francis S. Friel, Chairman of the U. S. Committee on Large Dams, which was host for the congress. At the closing session the presiding officer was Gail A. Hathaway, also of the U. S. and current president of the International Commission on Large Dams (ICOLD), all of whose 43 member countries sent delegates to the congress.

At the meeting of the Executive Committee of ICOLD, J. F. Rebelo Pinto, director, Portugal Water Power and Irrigation Department, was elected president to succeed Mr. Hathaway. Vice Presidents will be Francis S. Friel, U. S.; Susumu Nagata of Japan; Milan Vercon, of Yugoslavia; Hamed Sulciman, of the United Arab Republic; Pietro Frosini, Italy; and A. A. Borovov, U. S. S. R.

Rome was selected as the location of the next International Congress in 1961. The technical questions to be discussed at this congress will be determined at the next Executive Committee meeting, which will be held in Helsinki, Finland, in August 1959.

I. Dam Heightening

In his report on papers devoted to dam heightening, Senor Toran called attention to the very early beginnings of the technique—Alamansa Dam in Spain, built in 1384 to a height of 46 ft, raised to 69 ft in 1586 and still in use. He also noted that the total number of dam



12 ways to raise a dam—**These typical examples of some possible methods are from a paper by Cristen**

heightenings is now about 100, mostly accomplished in the last 30 years.

Famous examples include Egypt's Aswan Dam, built to 99 ft in 1902, raised 16 ft in 1912 and another 36 ft in 1933 to increase its storage capacity to five times the original. Bombay's Tansa Dam for India's water supply was built to 118 ft in 1892 and raised in two steps (1914 and 1925) to 133 ft. After the last heightening dangerous tension was found to exist on the upstream face, when previously ignored uplift forces were considered, and the dam was further strengthened by vertical prestressed cables anchored in the foundation rock.

Notable U. S. dam heightening, mostly planned when the original dam was built, includes Lake Spaulding concrete arch dam in California, raised from 226 ft to 261 ft in 1916; O'Shaughnessy arch gravity dam in California, raised from 346 ft to 432 ft in 1923; Marshall Ford gravity-type dam in Texas, raised from 198 ft to 280 ft in 1939.

Most notable of all U. S. efforts is Ross arch dam in Seattle. It was built to a height of 290 ft in 1940 and carried to 475 ft in 1945 and to 540 ft in 1948. A further raising to 658 ft is planned during which a downstream thickening will be carried out tied to the existing construction by the checkerboard pattern of keyways shown on the dam face in the picture on page 23.

The most important U. S. dam heightening now under way is on the Pacific Gas & Electric Co.'s Balch Dam, a thin arch constructed to a height of 93 ft in 1927, with provision for thickening and raising to 138 ft. This work is now going on, using grouted aggregate concrete.

World-wide, the most ambitious heightening job is on Grand Dixence gravity-type dam in Switzerland. Being built in stages with unusually careful attention to the joints between old and new concrete, Grand Dixence (third from left, above) will rise in stages to 940 ft and be the world's highest dam.

These precedents have provided enough background, according to discussions at the congress, to permit future dam heightening to go forward with efficiency and certainty. The large number of schemes presented in the papers attest to the thought that engineers are giving to the problem.

Among the many conclusions that could be drawn from the discussions, two were emphasized many times:

- Joints between old and new concrete can be made monolithic by the use of keys and by designing the joint to follow isostatic lines. Nevertheless, it seems better to keep the joint open until the effects of shrinkage and other adjustments have taken place. Using grouted aggregate in the joints has proved useful in avoiding shrinkage effects.
- Stressed cables are useful in improving the stability and strength of dam sections in heightening operations.

To a criticism that they are mechanical devices, which may not furnish the permanence desired, proponents of stressed cables pointed to their successful use in a number of dams dating back to Cheurfas Dam in Algeria in the early thirties. They also claimed for them a sizable reduction in the amount of concrete required and the elimination of enlargement and joint preparation in heightening operation.

2. Deformations

Tokujiro Yoshida, professor emeritus of Kyushu University in Japan, was the general reporter on comparison of stresses and deformations. His task was to report on 59 papers.

The specific topic was: "Observation of Stresses and Deformation in Dams and in Their Foundations and Abutments; and a Comparison of These Observations with Computations and Tests on Small Scale Models."

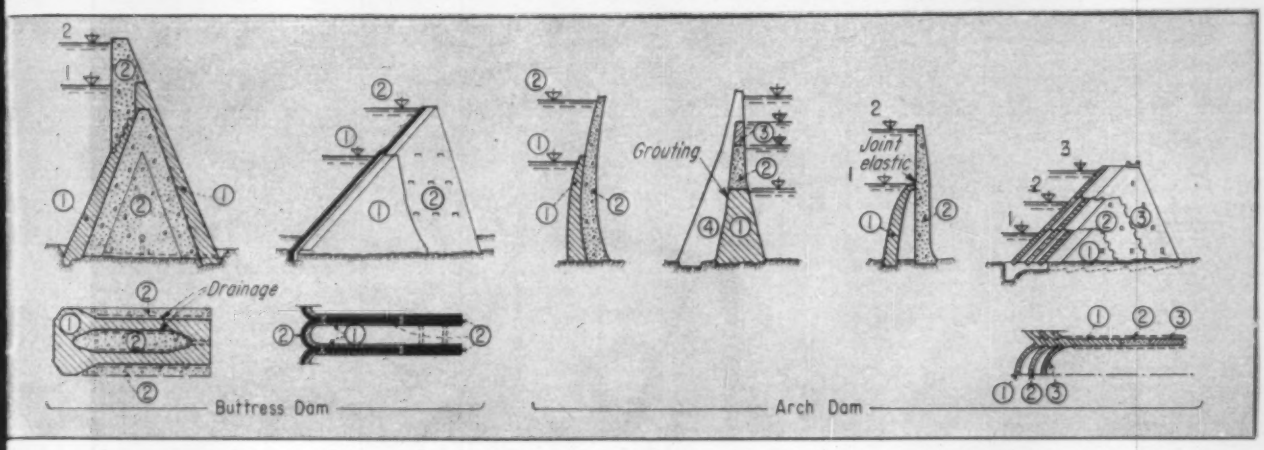
Foundation movement, pore pressures, deformation in dams, temperatures—these were among the changes measured. Geodetic methods, photogrammetry, pendulums, clinometers, strain gages, thermocouples were some of the measuring devices.

Earthfill and rockfill dams were measured and observed as well as concrete structures. Measurements were made both during construction and later, under operating reservoir loads.

One paper presented a photogrammetric method of measuring deformations of a rockfill dam. On the grounds that the usual surveying methods would not produce a true picture of deformations, stereo pairs of ground photos taken on a long base line were used for the determination.

One of the Soviet papers gave an account of a study of the effect of grout curtains and drainage on the uplift intensity in concrete gravity dams built on rock foundations. It was reported that where grout curtains and drainage were provided, the percolation head dropped more than 80% in the area between them. From investigations on one dam, it was concluded that in the case of either sound or unsound foundation rock, a vertical grout curtain is more reliable and effective than an upstream clayfill apron. This study also resulted in the recommendation that any drainage system that can't be inspected and cleaned should be avoided.

An Italian paper compared observed deformations of five dams with results of static tests made on corresponding models. Conclusions were that model deformation and true deformations due to hydrostatic loads agree in the case of thin arch dams but sometimes deviate considerably for thick arch or arch-gravity dams. It was also concluded that experimental research will predict displacements due to thermal effects with sufficient accuracy if both thermal effects and deformability of rock foundations are taken into account.



Mateescu of Rumania. Numbers indicate stages of dam construction.

Professor Yoshida expressed the hope that the studies he reviewed will "help to reduce the margin of ignorance, the so-called margin of safety, which has been so expensive to pay for and yet did not give assurance of a definite amount of protection."

His conclusions: As good damsites become scarce, techniques for improving rock foundations "become of extreme consequence." It is therefore important that methods of making measurements on foundation materials be standardized if future observations upon them are to be comparable.

Effects of earthquakes on dams must be studied, since dams must unavoidably be built in earthquake zones. Model studies can be of use here, but they may not tell the whole story.

Construction records—how the work was done to meet specifications—plus a dam's operational records, are as important as leaving good dams to posterity, reported Professor Yoshida.

3. Compaction Methods

"Earth dams have been constructed successfully for centuries, but mainly as works of exceptionally talented individuals, based on empirical experience and traditional knowledge." Now, however, designers generally have been given the necessary tools.

That was the report of Ervin E. Nonveiller, of Yugoslavia, general reporter for the 21 papers on compaction methods.

"It is possible to establish the proper placing and compacting procedure, equipment, and moisture content for various kinds of soil [under] adverse climatic conditions and peculiar site conditions," Mr. Nonveiller added. "It can be concluded that methods and equipment for compaction of materials for earth and rockfill dams have reached the versatility necessary to suit the most variable kinds of soil and load conditions."

Papers supporting this conclusion point up the fact that a wide variety of tried and proved compaction methods predominate in dam construction. For rockfill placement, dumping in high lifts and sluicing produces good results and are better suited than other methods to mechanized operations. Other methods reported include rolling and vibrating alternately and vibrating alone.

Soft rock compaction is carried out mainly with rubber-tired rollers, sometimes combined with sheepsfoot rollers, vibration and/or sluicing—all after disintegration and curing in the pit. Pit treatment is carried out with explosives, water and tamping rollers.

For gravelly and sandy soils, heavy rubber-tired rollers, vibrating rollers and sledges and internal vibrators are used. Sheepsfoot rollers are used sometimes if silt and clay content is high.

Cohesive soils are compacted in thin lifts with heavy sheepsfoot rollers. Moisture content is well controlled. Some of the reports mentioned devices like the steel mesh cylinder, segmented roller and grid roller, but performance of these new types was not established. In some instances, however, rubber-tired rollers produced higher dry densities and better homogenization of the soil with fewer passes. One report described the use of sheepsfoot rollers followed by rubber-tired rollers. This prevented the harmful lamination that might result from use of rubber-tired rollers alone on cohesive soil.

In laboratory investigations of soil compaction, Proctor and AASHO test procedures, featuring impact loading to consolidate samples, still dominate. But kneading of samples, to more nearly simulate the action of sheepsfoot rollers, shows some promise.

Mr. Nonveiller noted the recent introduction of a 50 ton self-propelled sheepsfoot roller and predicted that even more powerful and more efficient equipment will come into service to speed up the placement of fill materials.

4. Cement Substitute

Concrete for dams should be air-entrained; fly ash and pozzolans improve concrete workability and frost resistance, lower heat evolution and shrinkage and slow the development of full strength.

Those are the general conclusions established by the 29 papers on admixtures, pozzolanic materials and the influence of fine sand particles, as reported by reporter Christian Groner, substituting for Kristen Friis.

Prevailing opinion concerning fly ash and pozzolans also holds that chemical analyses are absolutely necessary to determine whether detrimental reactions with the cement are to be feared.

Fine sand particles were found detrimental to concrete quality. Preparatory studies made for three Italian dams showed that elimination of sand particles smaller than 0.06 mm in diameter decidedly improves the concrete's workability, frost resistance, compressive strength and water tightness.

Calcined shale and clay replaced 20% of the cement for two big dams in India, according to one report, and reduced bleeding and permeability without decreasing compressive strength. Fly ash was substituted for 15% of the cement on a French dam job with resulting easier working and lower heat of hydration. Strength of the concrete at 90 days tested as high as mix with no fly ash. Effects of pozzolans in 13 U. S. Bureau of Reclamation dams are discussed in one report. They cut heat of hydration, permeability and reactive expansion. They also improved workability, lowered frost resistance, and lowered the 28 day strength of the concrete. Strength continued to increase, however, until in some cases it became stronger than nonpozzolanic concrete.

A Corps of Engineers study indicated that up to 70% of the cement in concrete was replaced by finely divided mineral material.

Walt Whitman Bridge, Philadelphia (Class 1, for bridges with spans of 400 ft or more)
Designers: Modjeski and Masters, Harrisburg, Pa., and Amman & Whitney, New York City. Judges comment: "The lacy appearance of the bridge deck contrasts dramatically with the solid towers."

Here Are the Most Beautiful Bridges

Fourteen bridges in 11 states have been chosen as the most beautiful opened to traffic in 1957. The top four prize-winners are shown on these pages. There were 81 entries in the 30th Annual Aesthetic Bridge Competition, sponsored by the American Institute of Steel Construction. That was the largest number of entries ever.

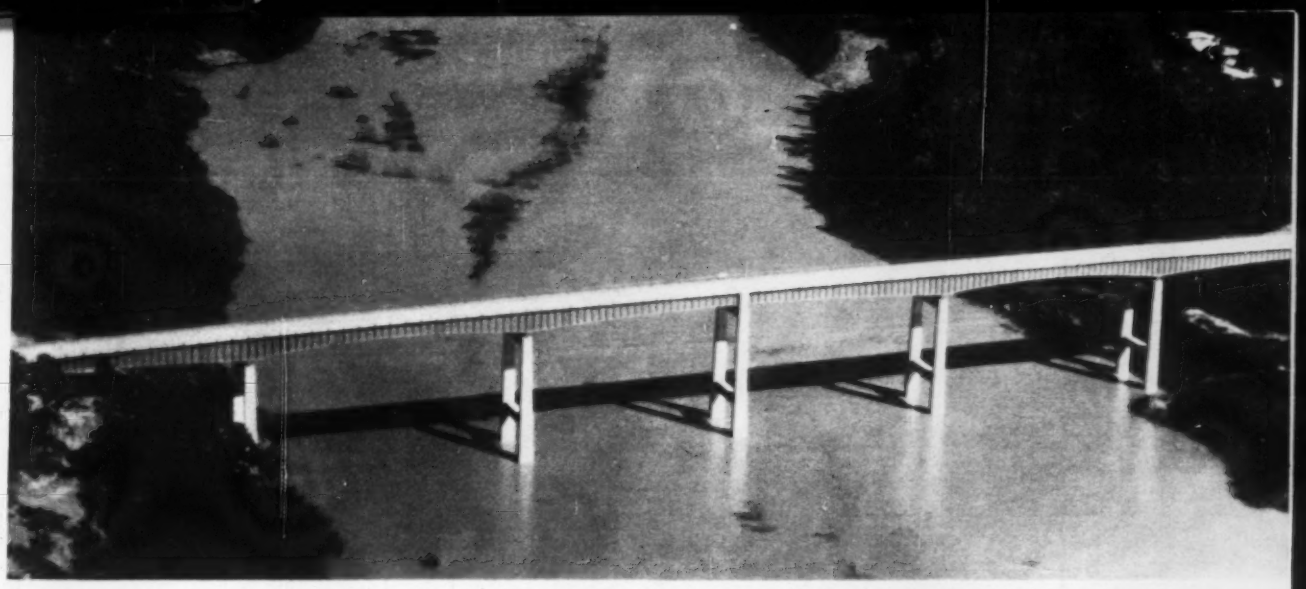
Honorable mentions were awarded to (first named in each class won the first honorable mention):

Class 1: La Conner Bridge, Skagit County, Wash.; Colorado River Pipe Bridge, Topock, Ariz.

Class 2: Trinity River Bridge, Hoopa, Calif.; St. Lucie Bridge, Martin County, Fla.; Clark's Summit Bridge, located in Lackawanna County, Pa.

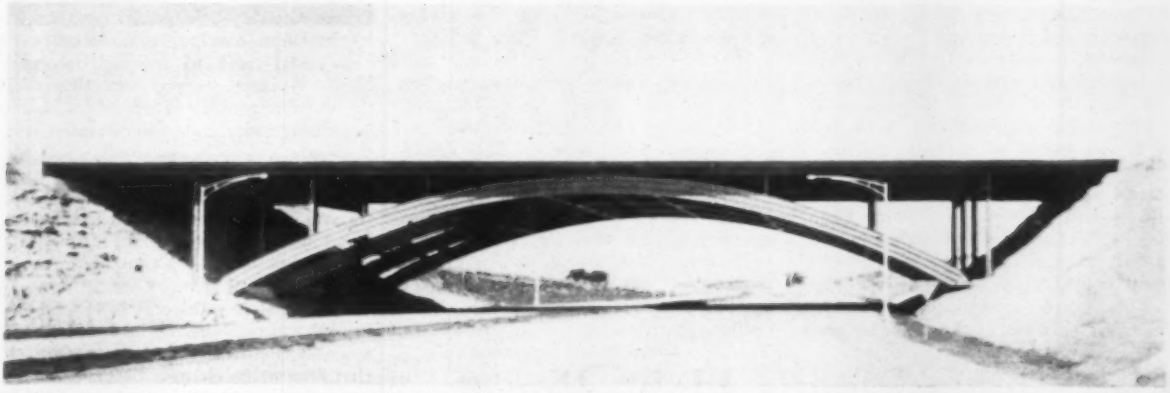
Class 3: Shell Road Ramp Bridge, Baltimore Harbor Tunnel, Maryland; White Salmon River Bridge, Klickitat County, Wash.; Putah Creek Bridge, Napa County, Calif.

Class 4: Robert Craig Memorial Bridge, Toledo, Ohio; Inner Harbor Navigation Canal Bridge, New Orleans.



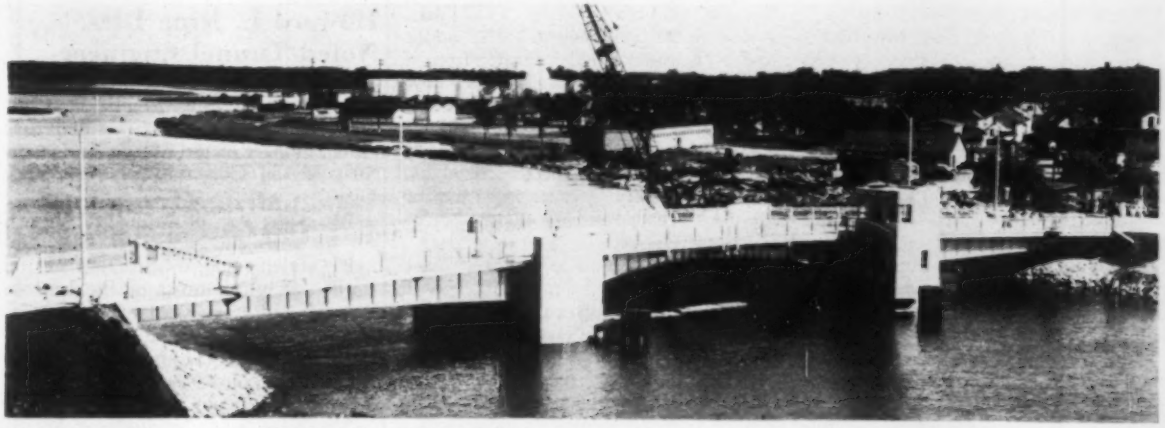
General James Longstreet Memorial Bridge, Gainesville, Ga. (Class 2, for bridges with fixed spans under 400 ft, costing over $500,000)

Designers: Patchen and Zimmerman, Augusta, Ga. Judges comment: "Its sensitive design does not interfere with its natural setting." Design of the handrail was complimented because it allows excellent visibility.



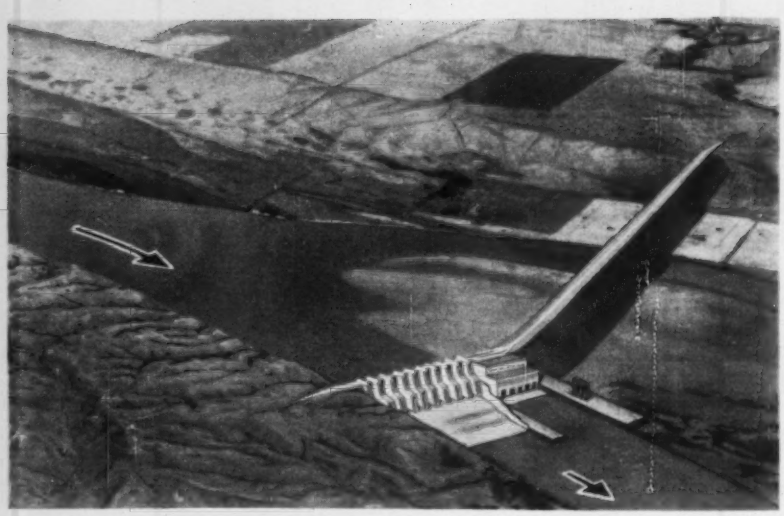
Hampton Road Overpass, Dallas (Class 3, for bridges with spans under 400 ft, costing less than $500,000)

Designers: Powell & Powell, Dallas, Judges comment: "The clean looks and graceful arch . . . drivers would have a sense of passing under a much higher bridge."



Madison-Monroe Street Bridge, Two Rivers, Wis. (Class 4, for bridges with movable spans)

Designers: Hazelet & Erdal, Chicago. Judges comment: "Pleasing balance between the accents of horizontal and vertical lines." Placement of the operator's control room was praised.



Sixth Missouri Dam Planned

Big Bend Dam, fifth in size and last of the Missouri River series, will be under construction next spring, the Army Engineers has announced.

The $85 million earthfill barrier will be 102 ft high and 6,460 ft long. Reservoir capacity will be 2 million acre-ft.

Other dams that make up the Corps of Engineers' flood control system in this northwestern and north central area of the U. S. are Fort Peck in Montana, Garrison in North Dakota, Oahe and Fort Randall in South Dakota, and Gavins Point, which spans the Missouri from both South Dakota and Nebraska.

The new dam will be located at Fort Thompson, a short distance downstream from a sweeping 25 mile loop in the river, called Big Bend, which is one of the Missouri's most distinctive features (ENR Aug 30, 1956, p. 25).

It was originally planned to build the dam in Big Bend itself, running the power tunnels across the mile-wide neck of the loop. However, investigation showed that a downstream dam would avoid the extensive power tube excavations, and offer an increase in head that would double the power output. The downstream location also will provide better foundation conditions.

Power output capacity of the project will be 240,000 kw, generated by four 60,000 kw units.

Fish Fights Plague Idaho Power

An undermined fish trap has started another government vs private interests battle on the Snake River in Idaho.

This time Oregon's Gov. Robert D. Holmes has charged that the Idaho Power Co. illegally cut flow of the Snake at the company's Oxbow damsite to zero for 12 hours August 31. As a result, says the governor, "the bed of the stream was completely dried up for a distance of 50 miles, killing many fish." Idaho Power says the governor was "grossly misinformed" and to its knowledge there was no damage to fish.

Governor Holmes also charged that Idaho Power hasn't made enough studies of possible injuries to fish because of the new dams.

The company admitted reducing flow below 2,000 cfs for a short period, but denied ever reducing it to zero as charged, or below 2,000 csf for as long as 12 hours.

Idaho Power received permission from the Federal Power Commission August 27 to make an emergency reduction of river flow from 5,000 to 2,000 cfs for repairing a fish ladder bypassing the site of Oxbow Dam. (The dam is now under construction.) The ladder had been undermined by water from a diversion tunnel carrying the river flow past the damsite. This caused a crack and placed the fish trap in danger of complete destruction unless repairs were made immediately. Speed was necessary also because the season's run of Chinook salmon already was approaching the site.

Attempts were made to drive sheet piling to reinforce the trap, first against full flow from the diversion tunnel, and after that proved impractical, with flow reduced to 2,000 cfs. The piling was driven successfully with the low flow but was washed out when full flow was resumed.

A cofferdam was thrown hastily across the mouth of the diversion tunnel on August 31, stopping flow completely so piling could be driven again. But with the opening of the cofferdam the piling was washed out again.

Meanwhile the Snake, which is only partially controlled upstream at Idaho Power's Brownlee Dam (where the spillway gates still are to be completed), was rising rapidly. Finally it was decided to breach the main cofferdam protecting the Oxbow site and to seal both ends of the diversion tunnel from the river with small cofferdams.

The contractor, Morrison-Knudsen Co., is working three shifts to fill the holes under the fish trap with rock and concrete to build a strong foundation. About two weeks are needed to finish repairs and place a concrete apron. Flow in the river is now at the seasonal norm of 15,000 cfs.

With the river flow at its present level, Idaho Power asked for and received FPC permission September 5 to begin operation of the first generating unit at its nearly completed Brownlee Dam—and promptly ran into more fish troubles. Idaho and Oregon conservationists have complained that Idaho Power should have made, and ought to continue making, more studies of possible injuries to fish at Brownlee Dam. Without such studies, they said, the current generating operation might be killing migratory fish, because the traps are not fully operating.

Idaho Power countered that its license required it to spend $250,000 for fish studies and that it has already spent more than that.

Conservationists also have questioned the efficiency of some of the fish ladders and traps at Brownlee (ENR Aug. 14, p. 46). Since the company's license requires the FPC to consider requests that reasonable changes be made in the fish structures, the commission has called a conference to thrash out the issues between the power company and state and federal conservation agencies.

Howard L. King Dies, Noted Tunnel Engineer

A distinguished career in tunnel engineering ended this week with the death of Howard L. King, vice president and chief engineer of the Mason & Hanger-Silas Mason Co., Inc., of New York City.

Mr. King was probably best known for his work on New York City tunnels. He directed construction of the north and south tubes of the Lincoln Tunnel and was associated with construction of the Holland and Brooklyn-Battery tunnels. He also served as consultant on construction of the third tube of the Lincoln Tunnel.

Mr. King was a graduate of Massachusetts Institute of Technology. His professional honors included the 195[illegible] Moles Award for distinguished serv[illegible]

Hoist Tower Is Doubling As Outside Service Elevator

Usually when a tall office building has been completed the construction hoists on the outside are removed immediately. But while tenants are moving into the 34 story, gold-colored skyscraper at 51st St. and Lexington Ave., New York City, its two hoists still remain.

The builder, Sam Minskoff & Sons, Inc., believes it is advantageous to use the outside hoist instead of the building's elevators for bringing in materials and equipment needed for finishing the interior to tenants' requirements.

The double-hoist tower and runways to the building have a supporting framework of steel pipe extending 425 ft above the street and extending as much as 60 ft out from the building because of setbacks.

The skyscraper is noted for its exterior of gold-colored aluminum panels (ENR Nov. 7, 1957, p. 28). Sylvan Bien and Robert Bien are the architects

Community Contributions Pay for Engineers' HQ

The Cleveland Engineering Society has a new home. The $1.5 million Cleveland Engineering and Scientific Center will house the society and more than 50 other professional groups affiliated with Cleveland Technical Societies Council.

Construction was made possible by gifts of more than $1 million donated by several hundred industrial and business firms and thousands of individuals.

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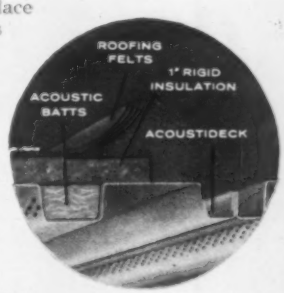

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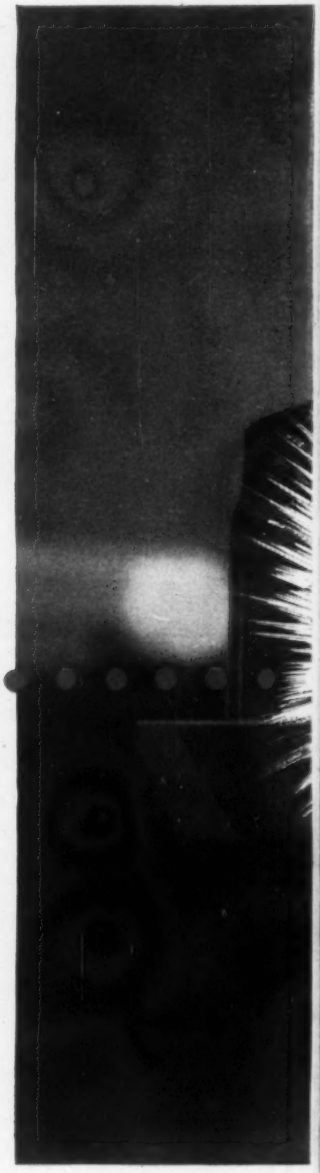
RD-18

New "Jimmy" Diesel..... gets a big hand!



New GM "71E" Diesel produces lower-cost miles than ever obtained before—now available for any make truck 26,000 GVW and up

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And if the truck you choose isn't immediately available with a "Jimmy," turn it over to the GM Diesel distributor for a "71E" installation. *You'll be money ahead!*

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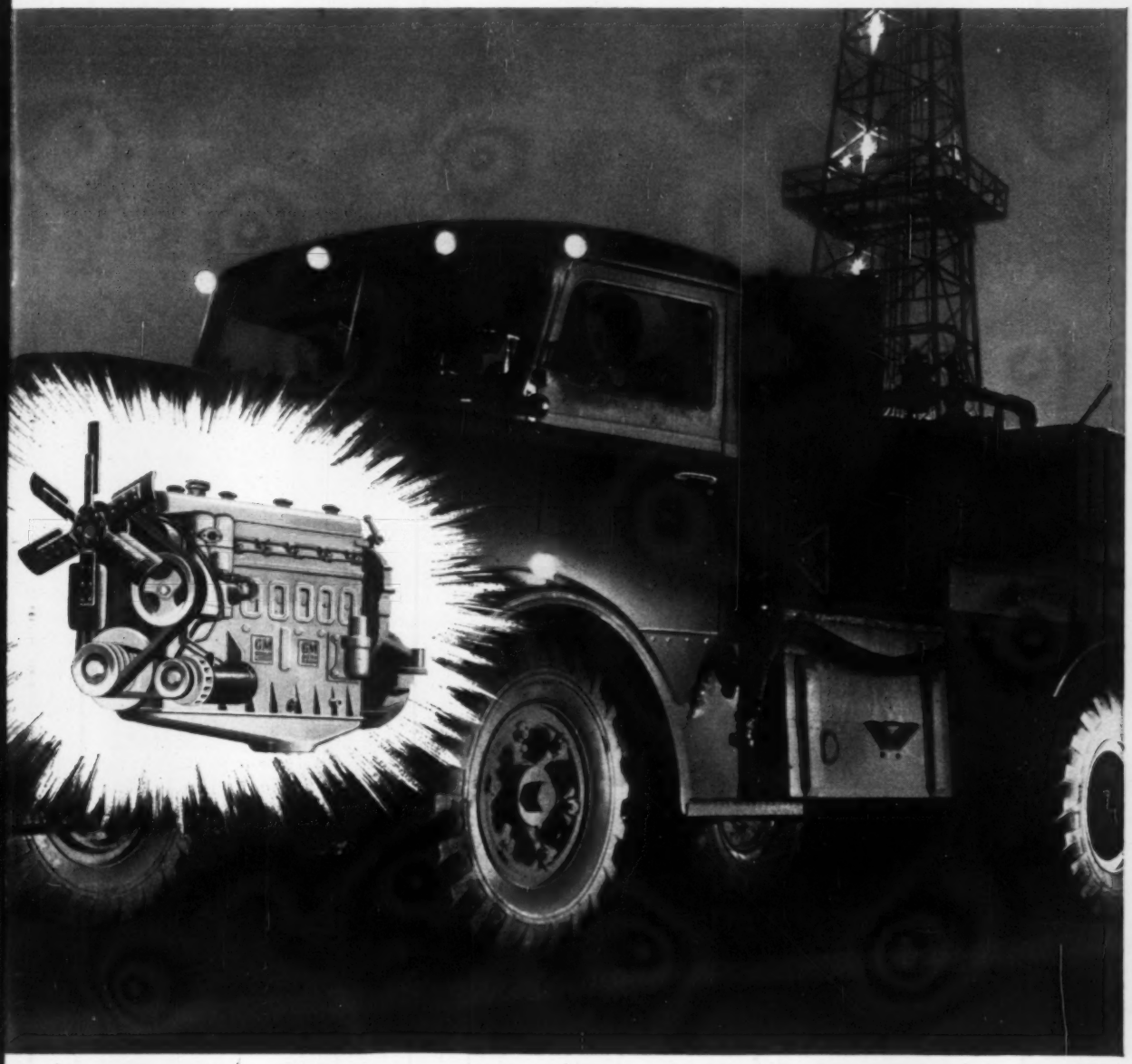

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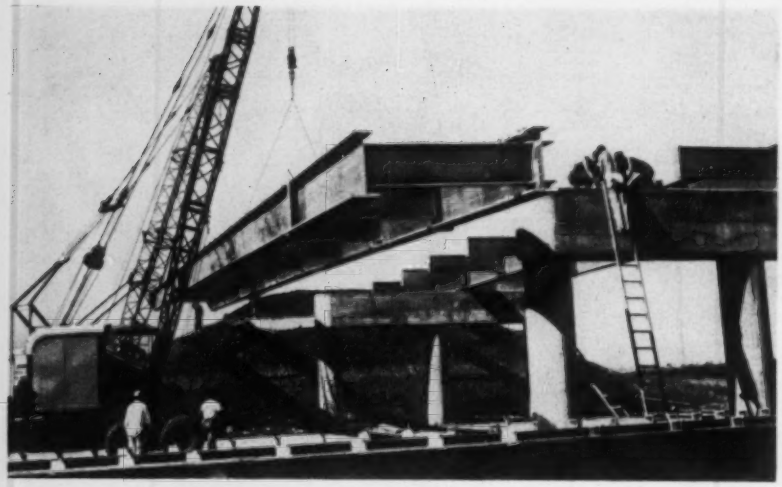


Aluminum Sections Make . . .

. . . A First in Road Bridges

The first aluminum girder highway bridge in the world is ready for traffic. An aluminum foil ribbon was cut yesterday at dedication ceremonies in Des Moines.

The 222 ft long welded structure is a developmental project (ENR Feb. 20, p. 30). By this demonstration of the structural and fabrication features of aluminum, it is hoped to stimulate broader use of the metal in the highway construction program.

The bridge is a two lane, four span continuous girder structure. It is 36 ft wide with a 30 ft roadway.

Aluminum structural members were shop fabricated and shipped in four giant subassemblies by rail from Chicago. The subassemblies were 12 ft wide and from 95 to 126 ft long. Each consisted of an exterior and interior girder plus connecting diaphragms.

The sections were lifted by crane onto concrete piers and bolted in place. A reinforced concrete deck was then cast and railings installed. The deck is tied to the girders by aluminum shear connectors for composite action.

The four continuous girders are spaced 9½ ft apart under the roadway. Girder and diaphragm system is of welded plate construction, using high strength weldable aluminum alloys. Plate is from ½ to 1¾ in. thick. A typical main girder is made up of a ½ x 36 in. web, a 1¼ x 18 in. lower flange and a ¾ x 12 in. upper flange. A typical diaphragm has a ½ x 23 in. web and 1 x 10 in. flanges.

The bridge was put under construction last December. The aluminum components were included in the winning low bid of $124,782.73.

The bridge is sponsored by the State of Iowa and three aluminum companies —Aluminum Company of America, Kaiser Aluminum & Chemical Corp., and Reynolds Metals Co.

It was designed by Ned L. Ashton, Iowa City consulting engineer, under the direction of the Iowa Highway Research Board and the Iowa State Highway Commission.

Aluminum fabrication was by Pullman-Standard Car Manufacturing Co., Chicago. General contractors were Jensen Construction Co. and United Contractors of Des Moines.

Another Alma Mater

Contracts to be let for new Florida university

Ground was broken this month for a university that will be built from scratch —the University of South Florida. It will go up on the outskirts of Tampa.

Construction contracts for the first of five original buildings will be let within a month; others are to follow shortly. Cost of all the buildings is expected to run about $8.6 million, the amount appropriated by the state legislature.

The five original buildings will be a three-story classroom-cafeteria building, costing $1.5 million; a six-story library-classroom building with a two-story annex, $1.5 million; a classroom-administration building, $1.5 million; a science-laboratory-classroom building, $1 million; and an auditorium-theater building, $400,000.

The facades of the buildings will be of brick, bracketed by exposed white, reinforced concrete columns. Some of the facades also will incorporate a grill of precast concrete panels, which will shade windows of glazed glass.

The buildings will be founded on sand and in some cases the deep vibration method will be used to stabilize the soil.

Construction is expected to be finished in time for classes in 1960.

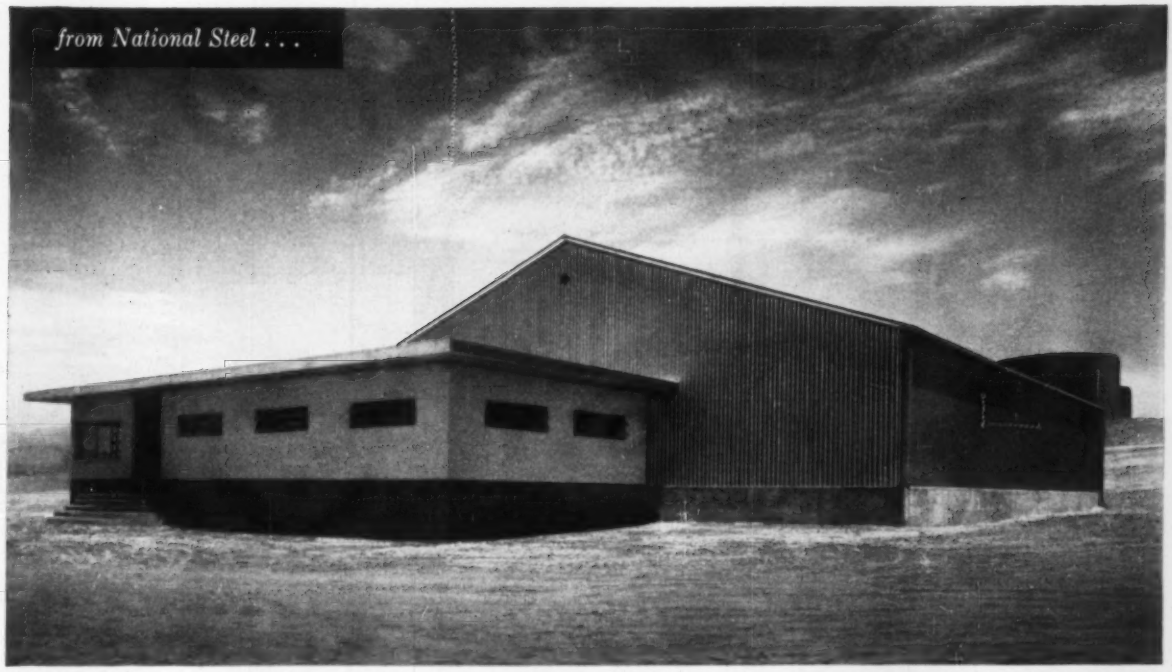
Five Florida architectural firms participated in design: Robert Little of Miami; Smith, McCandless & Hamlin of St. Petersburg; Pullara, Bowen & Watson of Tampa; Mark Hampton of Tampa; and Gamble, Pownall & Gilroy of Fort Lauderdale.

BRI Probes Problems With Resilient Flooring

Ways to improve installation of various flooring materials, such as asphalt, vinyl, rubber and cork tiles and linoleum, were the objective of a Building Research Institute conference on installation and maintenance of resilient smooth-surface flooring held in Washington, D. C., last week.

Major problems were highlighted in a report on a survey made by a BRI subcommittee. Information was supplied by 490 architects, general contractors, homebuilders, lumber and building material dealers, building owners and operators, and government agencies.

"Unsatisfactory performance of adhesives, improper nailing of underlayment and rough surfaces of concrete and wood-plant underfloors are high among the complaints," said Subcommittee Chairman Arthur S. Tisch, director, technical services department, Independent Nail & Packing Co., Bridgewater, Mass.



New El Paso pipeline terminal warehouse for El Paso Natural Gas Products Co. is a column-free 80' x 100' Stran-Steel Rigid Frame building with colorful blue walls in Stran-Satin Color, a new factory applied baked-on vinyl-aluminum coating.

This Stran-Steel Warehouse is a "Natural" for Industry

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Present construction is a pile-supported primary treatment plant on river fill, ringed by sheetpiling.

How Long Will This Primary Plant Do?

There is a sewage treatment plant worth watching under construction on the Hudson River above New York City.

Westchester County has a $12 million project there in Yonkers, N. Y.—a primary treatment plant with which it hopes to satisfy regulatory agencies for many years before increased population or changed river conditions bring orders to add secondary treatment.

New York State's Health Department and the Interstate Sanitation Commission (representing New York, New Jersey and Connecticut on clean-up of metropolitan area waters) agreed to let Westchester proceed with primary treatment despite ISC's (widely questioned) requirement of 60% suspended solids removal.

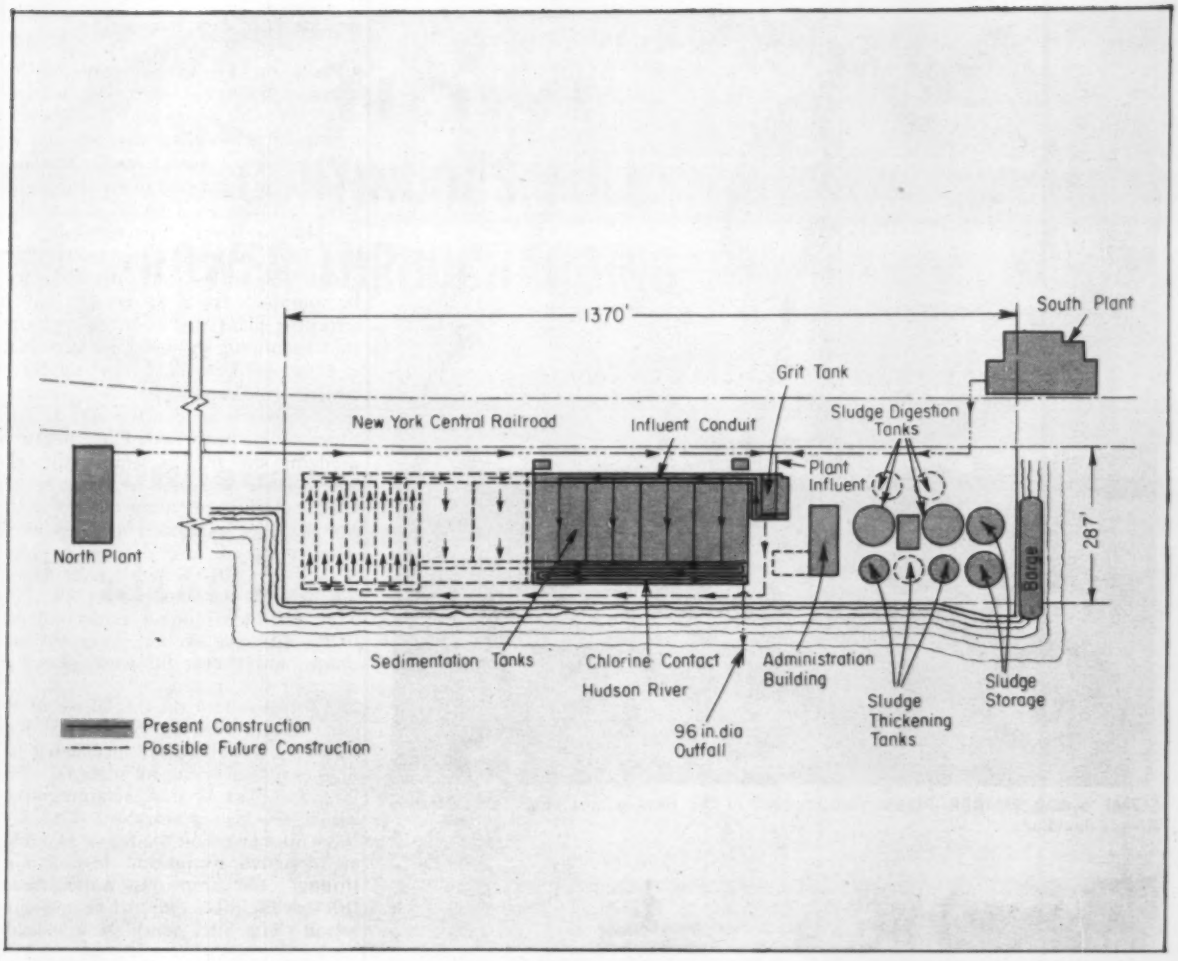
Westchester and its consultant, Greeley & Hansen of Chicago, say the plant will treat the county's relatively weak sewage—now getting 5% suspended solids removal through fine screens—to effect a significant improvement in the Hudson River's quality below Yonkers. The difference in pollution effect between the treatment anticipated by the primary plant and the prescribed degree of treatment is not worth another $1.5 million in cost at this time, they have reasoned.

The regulatory agencies' decision to let Westchester proceed with primary treatment has been questioned in New York City, the county's big downstream neighbor. William A. O'Leary, head of the city's Sewage Works Division, Department of Public Works, has voiced an objection to a plant not meeting the letter of the law on treatment. He thinks it should provide more than primary treatment.

It will be interesting to see just how closely the plant approaches the precise, prescribed degree of treatment—or how soon future conditions might push the county to add the further treatment envisioned in the design.

• **Design studies**—Much of the design depended upon the solids content of the raw sewage. Present concentration is 131 ppm. The designer allowed for an increase of 23 ppm due to anticipated increase in use of garbage disposal units by the design year, 1980. The design finally was based on a maximum suspended solid content of 154 ppm in the 63 mgd flow expected in 1980. Daily per capita suspended solids contribution was estimated at 0.16 lb.

The design calls for incoming sewage to be degritted in an aerated grit chamber that provides adequate capacity for grit removal from a maximum of 230 mgd expected in the year 2010. Effluent from the grit chamber will flow in an aerated channel to the sedimentation



Future construction, if needed, would include secondary treament for a sewage merely screened today.

How soon Might Treatment Be Added?

tanks. These tanks, key aspect of the design, will provide 2 hour detention at 63 mgd flow. Surface loading rate is 1,060 gal per sq ft per day.

Biochemical oxygen demand reduction is not a critical aspect of design since the Yonkers plant will discharge into a very large receiving body of water, the Hudson River, where dissolved oxygen content is satisfactory. A nominal reduction of 25 to 35% in BOD may be expected.

In the event that future requirements demand it, space is being left at the site to construct additional sedimentation capacity, and aeration tanks of 1 hour detention capacity at 63 mgd flow. This aeration would precede sedimentation and probably would include a low rate return of sludge of about 10%.

• **Size of structures**—Two aerated grit chambers, 63x22 ft, are being built. Water depth is 13 ft 9 in. Swing type tube air diffusers are being supplied. Normally, grit that settles out will be moved by screw conveyor and bucket elevator to air ejector pots that will pneumatically convey the solids through a pipeline directly into a separate compartment of a sludge barge. The grit chamber is sized to handle a maximum sewage flow of 230 mgd, expected in year 2010.

Each of four sedimentation tanks will be 99 x 150 ft with 12 ft side water depth. Sludge and scum collection mechanisms are to be of the conventional type.

A chlorine contact chamber after the sedimentation tanks will provide 18 minutes contact time. A 96 in. dia outfall, which will be supported on piles, will extend through the stone dike into the Hudson River, discharging under 40 ft of water.

• **Sludge handling**—Sludge will be pumped continuously from the sedimentation tanks to thickening tanks, where it will be sent to high-rate digestion tanks. Disposal will be by barging to sea.

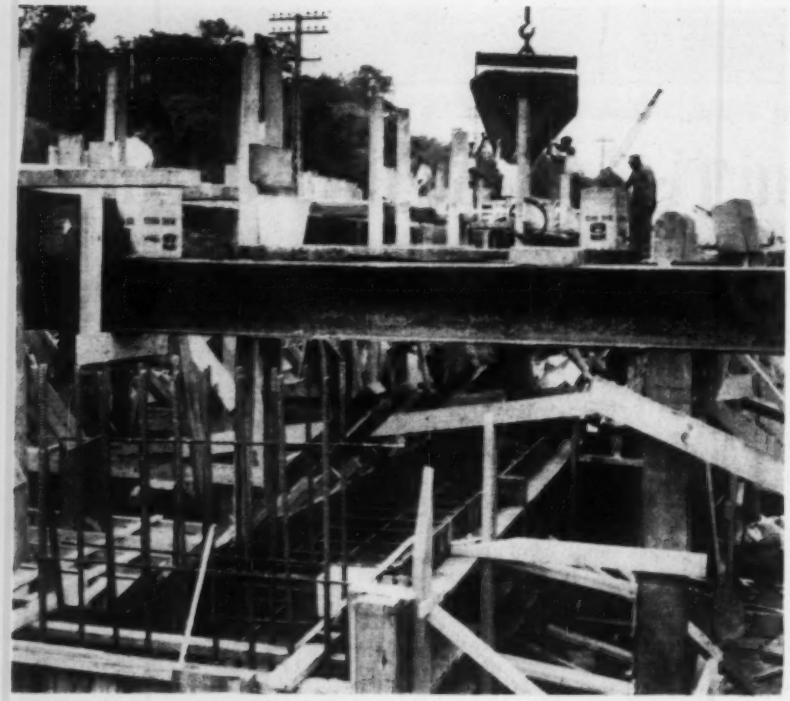
Two 45 ft dia thickening tanks, equipped with mechanical paddles, are expected to receive 48,500 lb of solids per day in about 0.5% concentration. This is a surface loading rate of 800 gal per sq ft per day. It is anticipated that sludge can be concentrated to 10% solids.

Two sludge digestion tanks, 70 ft dia with 30 ft side water depth, are being built. Loading rate at anticipated 60% solids removal at 63 mgd will be 6.2 lb of solids per cu ft per month. Tanks volume corresponds to about ½ cu ft per capita with a 30 day displacement period.

Two tanks of 60,170 cu ft capacity

. . . Plant in filled ground is pile supported

SOME 6,600 TIMBER PILES were required in the filled-in area beyond the Hudson River's shoreline.



CONCRETE is placed for iflow channel invert. Forms hang from 70 ft long wide-flange steel beams spaced 10 ft apart.

each will store digested sludge. At the expected 1980 operating rate, the tanks provide 16.7 days storage.

• **Plant on fill**—Construction of the Yonkers plant is as interesting as its design. As with more and more sewage treatment plants these days, land in the right place just wasn't readily available. The least expensive of many alternatives was to reclaim a 1,370x287 ft area from the Hudson River. This allowed gravity flow from an existing screening plant; about 30% of the influent will have to be pumped from a second existing screening plant that is being converted into a pumping station. The force main is some 1¼ mile of 54 in. reinforced concrete pressure pipe.

The contractor for the fill, J. Rich Steers, Inc., New York City, began by dredging the site to remove silt, clay and organic material previous to the construction of retaining dikes of stone. Material was excavated as deep as El −80 (mean sea level datum) in places. A shelf of relatively stable river deposit was left in place to protect the New York Central Railroad tracks adjacent to the site (see sketch). Vertical sand drains and excess fill were placed to compact this material.

The consultant on this phase of the job, Moran, Proctor, Mueser & Rutledge, New York City, specified a free draining sand as the fill material. This is held in place by stone retaining dikes, which are also permeable. The 2 ft thick filter layers on the top of two dikes are designed to prevent loss of sand through the stone as water moves through the dikes due to tide and wind action. The filter zones are a specially graded fine aggregate.

The contractor placed the sand and stone neatly. By keeping the stone dikes just a little higher than the sand, he was able to use bottom dump scows for both materials until he was out of water. The upper dikes and layers of fill were placed with floating cranes.

• **Dewatering trouble**—Strangely, a measure of the success of the dike and fill placement is the subsequent difficulty a second contractor experienced in unwatering the site. Although it will finally be replaced to El 8, the fill is now generally at El −8 to accommodate concreting of the sewage plant substructures. These are supported on timber piles driven to hardpan or bedrock.

To enable pile driving and subsequent concreting, the water level had to be lowered to approximately El −10 at the perimeter, assuming well points along both short sides of the area and the long outboard side just inside the stone dike. Counting on the stone dikes providing some degree of impermeability, the contractor tried at first to dewater using wellpoints alone. He installed 600

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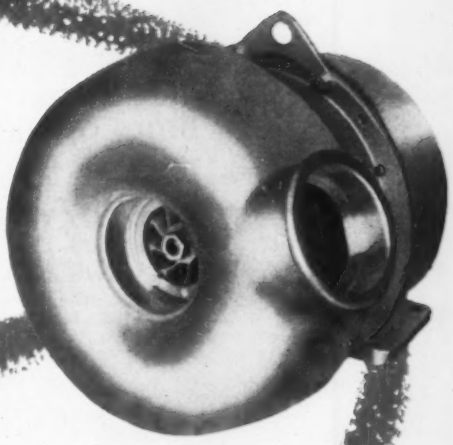
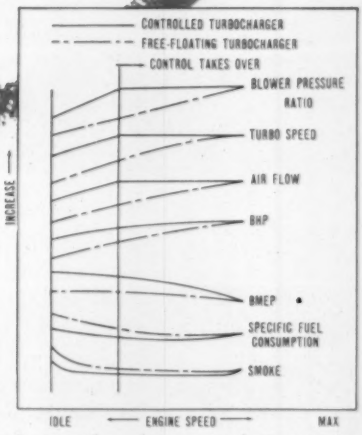


AiResearch control system keeps turbocharger output at ideal level



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. . . Sewage plant

2½ in. wellpoints generally at El −10 and had four 12 in. pumps. But the inflow of water was too much even for this extensive system.

It became necessary to install a cutoff. The contractor drove ZP-38 steel sheetpiling just inside the dike and relocated the wellpoint headers, as a pay item. Sheetpiling was driven to El −42 along the river edge. The flow of water was slowed sufficiently (by using up some of its head in the longer journey beneath the piling) so the wellpoints were able to keep the site dry.

As pile driving got under way near the river, the sheetpiling began bowing inward. The central portion moved some 12 to 14 in. Apparently, the pile driving vibrations cosolidated the sand fill so that the fill exerted less horizontal force against the piling. This combined with a hydraulic pressure due to the wall of water between El 4.5 (high tide) and El −10 (drawn down water level) developed a precarious cantilever situation in the sheetpiling.

Rather than brace the sheeting, which would interfere with site operations, pile driving in proximity of the sheeting was confined to low tide periods.

All told, 6,600 timber piles were driven, with about 5% of them treated with creosote. Piles were driven to refusal as deep as 48 ft along the river and some 10 ft on the upland side.

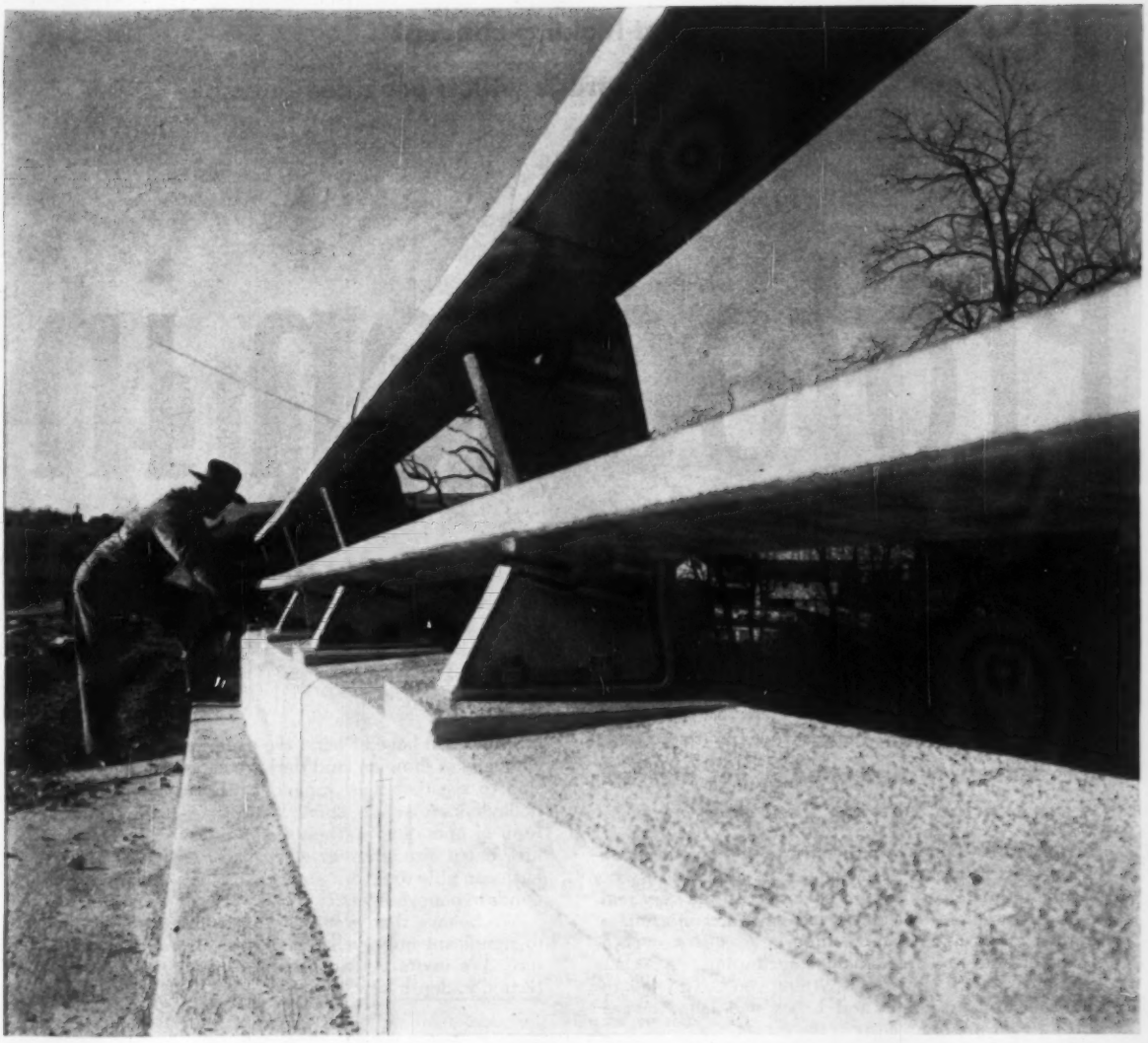
• **Uplift from concrete**—Some intricate concrete design in the grit chambers and inflow channel required the use of top surface forms. To hold these down against uplift from fresh concrete, the contractor used 70 ft long 89 lb steel sections spaced 10 ft apart. Forms were braced up against these beams.

A joint venture of Poirier & McLane Corp. and Psaty & Fuhrman, Inc., both of New York City, is constructing the sewage plant under a $6.3 million contract. Bernard Duffy is project manager, Donald Jordan, superintendent, and Albert Maiorano, project engineer.

For Greeley & Hansen, Paul E. Langdon is partner in charge, Carl W. Reh supervised design, George M. Hite, construction, and Erich Delora is resident engineer.

Construction of the site fill was under the direction of Eugene Rau, vice president and chief engineer, and Earl Larsen and Howard Van Ness, superintendents, for J. Rich Steers, Inc., which held a $3.2 million contract. Stanley J. Johnson was in charge of the site design for Moran, Proctor, Mueser & Rutledge with Edward Sanel as resident engineer.

James C. Harding and Guy E. Griffin, commissioner and deputy commissioner, are representing the Westchester County Department of Public Works.



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Bethlehem's new Perfect Vision bridge rail is attractive, sturdy and easy to install. Steel box channels and malleable iron posts arrive at the bridge site ready for quick installation. There's no welding or riveting necessary; after placing posts in position, only a few nuts must be tightened.

The new rail is made in four styles: one- or two-rail models for mounting on a parapet, and three- or four-rail designs for a curb or sidewalk.

Rails are furnished in any length from 7 to 20 ft. They are 2 x 5 in. box channels cold-formed from ⅛-in. steel and galvanized in accordance with ASTM specification A-123.

The galvanized posts are spaced on 9 ft 6 in. centers and connected to the parapet by four 1⅛ in. anchor bolts set in the concrete. The railing exceeds the requirements of the 1953 AASHO Specifications for railing loading. And when rails are damaged, they're easily replaced.

Get full details on this sturdy, handsome bridge rail, with "see-through" design. Just phone or write the nearest Bethlehem sales office.

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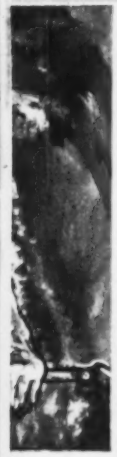

Test for tiredness. At Liberty's research center, a "worker" goes through his paces so that our scientists can learn to measure human effort and fatigue. Goal: new knowledge of when worker efficiency begins to fall off, cause accidents.

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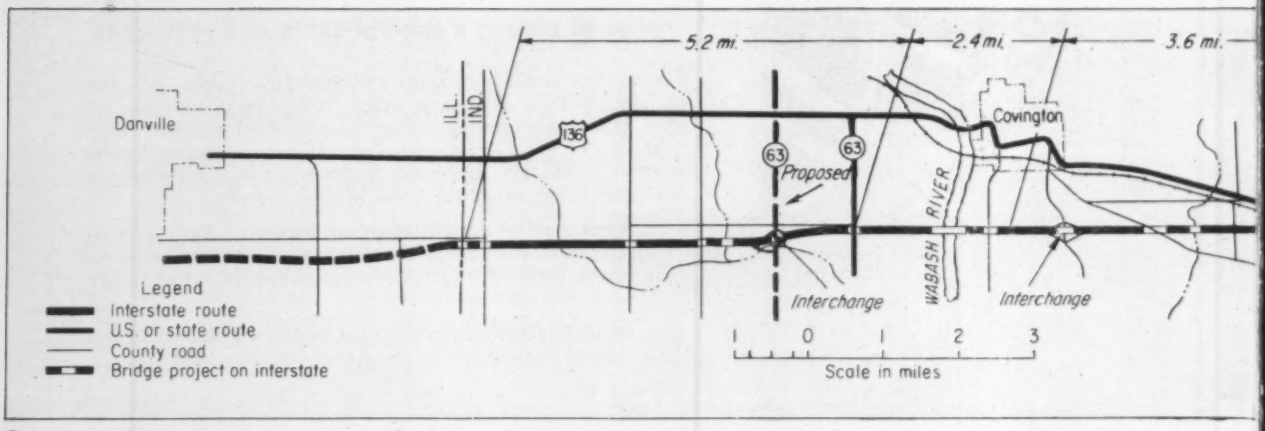
From these: Aerial photography, shot to print at 1 in. = 1,000 ft scale . . .

A stereoplotter, (specially equipped with an automatic recording device) to produce a 1 in. = 200 ft topo map . . .



Comes this: A completed interstate route including several overpasses, 2 interchanges and a major bridge over Indiana's Wabash

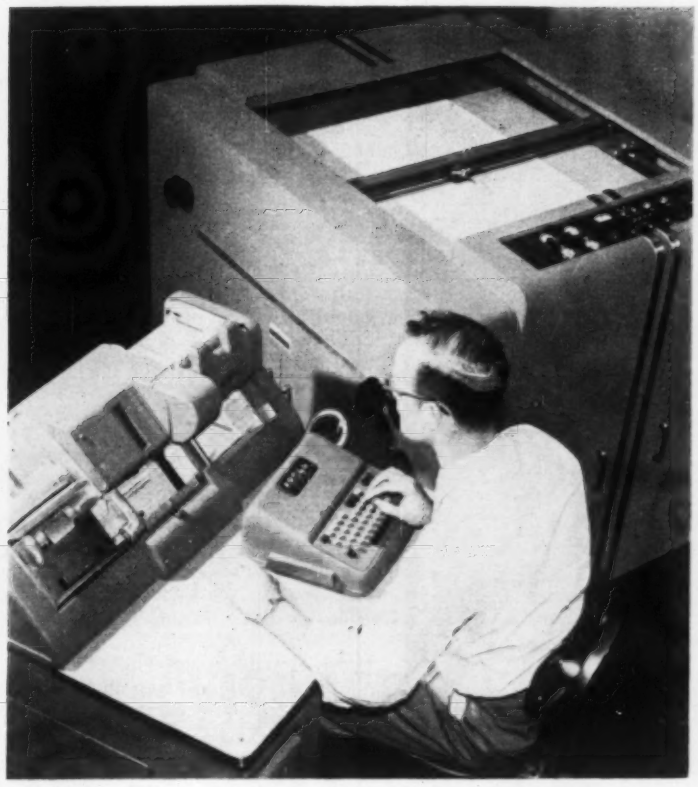
11 Miles of Interstate Designed in

The Indiana state highway department and a consulting engineer have given a persuasive demonstration of mechanized highway design.

The state received final plans for the first section of 11.2 miles of interstate just 16 weeks after approving a recommended line (located from a 1 in.= 200 ft topo map) and authorizing its consultant to proceed with design. Five weeks later, it opened bids on this section. Between the 16th and 20th weeks, the consultant submitted final prints for the remaining sections of the project.

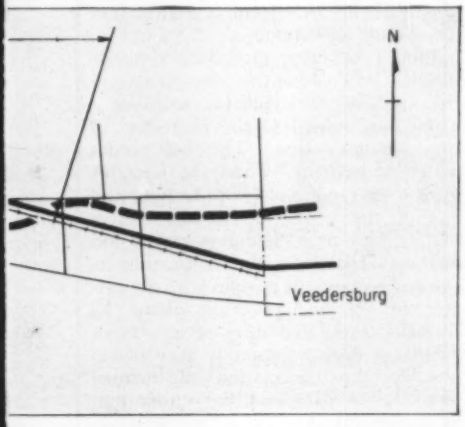
The route location study was equally impressive for its speed. The consultant received authorization to start surveying a 1¼ mile wide band only six weeks before line approved.

Just about every modern design tool available to the highway engineer was used. These included aerial photography, stereoplotters equipped with automatic recording devices, an electronic computer and an automatic continuous line plotter. A couple of



A line plotter, capable of turning out cross sections for every 100 ft and mass diagrams from punch cards used in the computer . . .

And the computer producing centerline elevations, plus complete coordinates of design cross section.



River.

16 Weeks

these tools were developed by the consultant on the job at hand, **E. S.** Preston Associates in association with Photronix, Inc., both of Columbus, Ohio.

• **Description of road**—The project is a relocation of U. S. Route 136. It begins at the Illinois border about 100 miles below Chicago and runs due east through rolling farmland. Dual lane, 24 ft reinforced concrete pavements are separated by a 50 ft median. Shoulders are 11 ft wide. They are stabilized to a width of 10 ft on the outside and 4 ft on the inside shoulder. Side slopes are varied from 4:1 to 2:1.

The 11.2 mile stretch contains two diamond type interchanges, seven grade separations, two stream crossings and a major bridge, 1,327 ft long, across the Wabash River. The route traverses relatively valuable farmland, which put a premium on careful analysis of right-of-way costs. The highway was designed for 70 mph traffic, with a maximum horizontal curvature of 1 deg 30 min and a maximum grade of 3.0%. Minimum stopping sight distance is 600 ft. A 16 min curve is the limiting horizontal curvature not requiring superelevation.

• **Route location**—Authorization to begin route location was given last October 24. The state had specified a 14 mile band for study. Aerial photography was exposed at 6,000 ft above the ground, giving a scale of 1 in.= 1,000 ft.

Ground control was extended through all the photographs using a photogrammetric technique. Ground elevations were known for a total of only 12 points over the entire 11.2 mile flight strip.

Four of these points were in the first photograph. A model of this photo was oriented in a stereoplotter (the Wild A-7). Then the plotter read coordinates for at least four points in each progressive photo in the flight strip, checking on the known elevations in the middle and the end. The coordinate information was then processed in an electronic computer for adjustment.

Experience has shown that this bridging technique produces ground control elevations and distances with an accuracy commensurate with that of the initial known elevations. On the Indiana job, the known points were obtained from USGS bench marks.

Bridging, of course, saves large amounts of ground survey work. Indiana state highway department engineers estimate that 600 manhours would have been required to establish ground control in the field for the U. S. 136 relocation. The consultant's forces spent only 64 manhours in the field and another 16 manhours using the stereoplotter and electronic computer.

• **Trial lines**—A topographic map of the entire 11 mile band at 1 in.=200 ft with 5 ft contour lines was then com-

WABASH RIVER CROSSING shows construction already well under way after speedy, mechanized design.

piled in a stereoplotter (Kelsh). The first topo map sections came out of the plotter early in November, only seven days after the flying. A map of the entire 11.2 miles was available less than a week later. The consultant vouched this map to be of standard accuracy—elevations within one-half the contour interval and planimetric features within 0.025 in. of true position. Armed with the topo map and individual prints for stereo comparison and a photographic mosaic of the bank at 1 in.=1,000 ft, the engineers began to select trial centerlines.

Five lines were considered, with two receiving major consideration. Terrain cross section data were picked off of the 5 ft contour map at average 300 ft interval. Station and elevation of each point of vertical curve intersection (PVI), length of each vertical curve, design cross section equations, and compaction factors were fed into an electronic computer. The computer printed out earthwork quantities, slope intersection points for the right-of-way analysis and a mass diagram.

After study, the location engineers revised the trial lines and grades as necessary and had earthwork quantities recomputed. All told, earthwork data were obtained for a total of 63 miles of trial line and grade.

The recommended line was arrived at in the normal manner—considering earthwork data along with structural costs of bridges, right-of-way costs, transportation costs and paving costs. A soils study made by aerial photo interpretation proved to be a significant aid.

The route location report was presented to the state on December 5. Indiana officials and the Bureau of Public Roads district engineer tentatively approved the line and grade that same day after an exhaustive all-day examination. The consultant was then authorized to proceed with design of the road.

• **Final design**—For construction purposes, the 11.2 miles of relocated Route 136 were to be divided into three road projects, of 5.2, 2.4 and 3.6 miles, and the Wabash River bridge. The design phase was organized accordingly.

The consultant first staked the approved centerline in the field, signaling points every 600 ft so they would show up in subsequent low level aerial photography. In this manner, accurate ground control was built into the photography. While in the field, the survey crews also set bench levels for construction and picked up miscellaneous right-of-way data.

A 2,200 ft wide strip centered on the staked out line was then flown at an altitude of 1,500 ft, which yields photographs at a scale of 1 in.=250 ft.

These low level photographs were used to prepare a 1 in.=50 ft planimetric map and to obtain terrain cross section elevations. Both steps were accomplished with one setting of the photographs, or models, in a stereoplotter.

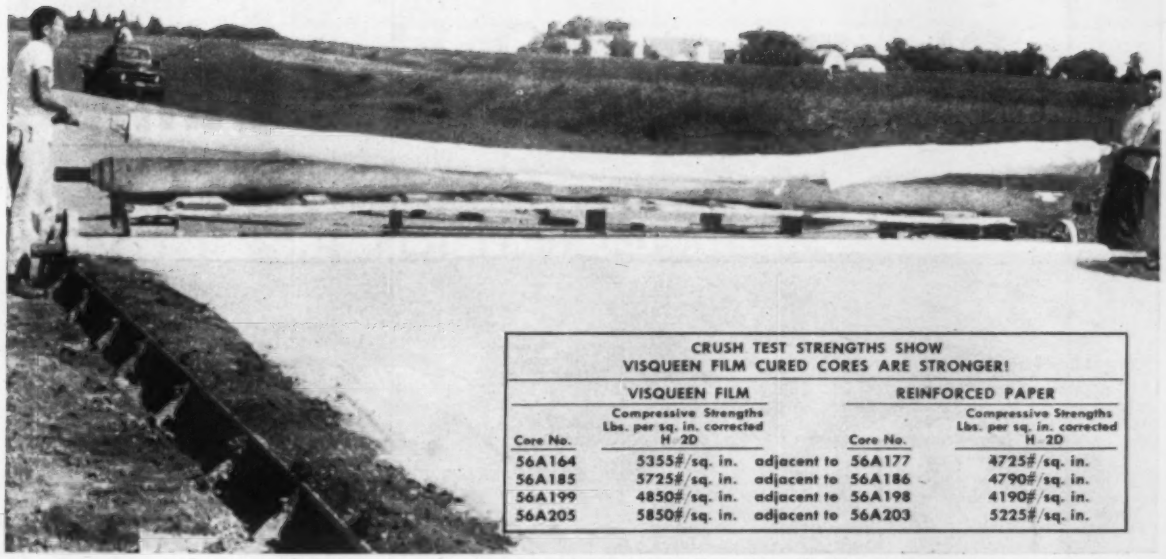
The planimetric map was compiled by the plotters in the normal manner—directly from the photo image. It was in obtaining terrain cross section data that remarkable speeds were achieved.

• **Fast terrain data**—The Photronix plotters are equipped with an automatic recording device patented by Mr. Preston. Once the platen, or "dot," is set on the elevation of the ground, the plotter operator merely steps on a foot treadle switch. This records—on punched paper tape and on a typewritten sheet—the station number, the horizontal distance from centerline and the ground elevation.

Plotter operator procedure is quite simple. After orienting the model in the machine, the operator positions a metal bar normal to the centerline at the chosen station. The bar guides platen movement. Then the operator reads breaks in ground both to right and left of the centerline in the stereoplotter, just as a field crew takes rod reading. However, the automatic recording equipment enables a good operator to get one point in about 1½ seconds, (not including setup time). The recording equipment also makes possible the elimination of manual handling of data and the errors that accompany it.

To guide the plotter operator in how far out to take terrain data, he is furnished the approximate distance of the slope stake point as obtained in the route location phase. On the Indiana job, he went at least 100 ft beyond. This was to allow for any possible shifting of the horizontal and/or vertical alignment.

Cross sections were taken every 100 ft. Point readings were recorded to the nearest 0.1 ft. Obtaining terrain cross section data for the entire 11.2 miles and producing the planimetric



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70-yard dipper and handle, crowd rack, bail and sheave blocks—all built stronger and lighter with USS "T-1" Steel.

105 tons in 50 seconds!

"T-1" and TRI-TEN Steels cut dead weight—boost strength

Big Paul, the King of Spades, is another of the world's biggest shovels. There are three of these 70-yard giants—all were built by Marion Power Shovel Company. All achieve strength and toughness with least weight by the use of USS "T-1" Constructional Alloy Steel and USS TRI-TEN high-strength low-alloy steel.

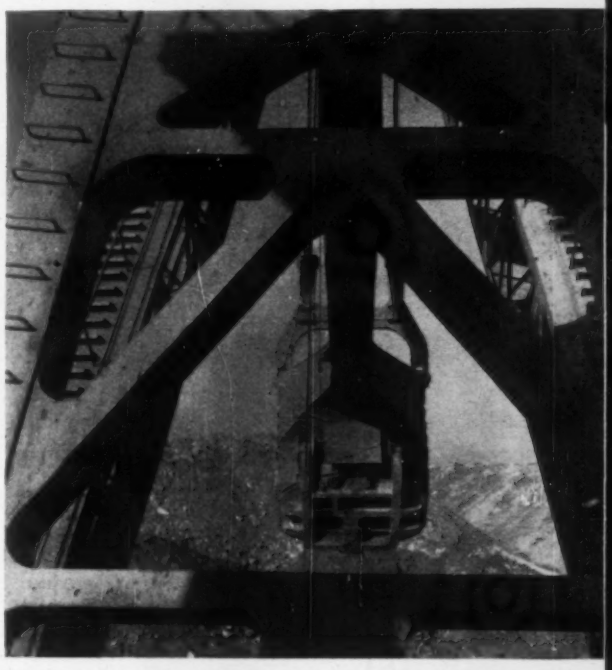
Big Paul sets the pace at the Peabody Coal Company's River King mine near Freeburg, Illinois. It rams through rock and shale to uncover some two million tons of coal per year.

Since 1950, the art of big shovel making has increased dipper size from 35 to 45, 55, 60, and now 70 cubic yards per bite. Most of these giant dippers are made entirely of USS "T-1" Steel, for it would be almost impossible to make them light enough and tough enough, otherwise. They hold up in this service, taking terrific impact abrasion and shock loading, even in the dead of winter. This is because USS "T-1" Steel retains its amazing toughness at temperatures far below zero.

USS "T-1" Steel has often enabled a boost in the capacity of original equipment without increasing size or weight. For example, a 20-yard bucket was replaced with a 24-yard "T-1" job. Other dippers were boosted from 26 yards to 32; and 36 yards to 45—increases of 25%.

Many other parts—dipper stick, bail handle and crowd rack—are built stronger and lighter with this 90,000 psi minimum yield strength constructional alloy steel. (USS "T-1" Steel plates are now available with a minimum Y.S. of 100,000 psi.)

The booms and A-frames of most shovels over 45 yards are designed with high-strength low-alloy steels with 50,000 psi minimum yield point . . . usually USS TRI-TEN Steel.



Boom crowd handle and welded A-frame are made of USS TRI-TEN high-strength low-alloy steel.

Perhaps you need a steel that offers higher strength, extraordinary toughness and resistance to impact abrasion, combined with ease of fabrication. USS "T-1" Steel is your answer, and we'll gladly help you adapt it to your application. For free booklet, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

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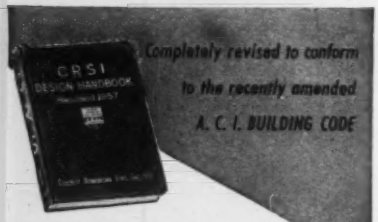

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. . . Final prints submitted within 20 weeks

map required a total of only 396 plotter hours. About 90 of the hours were spent in orienting the photographs. Another 180 hours of plotter time was spent in producing topographic maps with 2 ft contour interval at sites for bridges, interchanges and unusual structures.

This stereoplotting is nearly as fast as can be done pending the availability of "Oscar", an electronic device that can perform the plotter operator's basic function of "getting the dot on the ground" (ENR June 19, p. 23).

In terms of elapsed time, the 11 miles of terrain data were completed in mid-January, only 7 weeks after the strip was flown. Average width of the cross sections was 600 ft.

The consultant vouched that at least 90% of cross sectional spot elevations are within 0.2 ft of true elevation, which shows up better than in normal field surveys.

• **Computer phase**—The terrain data in the punched paper tape were converted into punched cards, which are the input media for the electronic digital computer operated by Photronix, (an IBM 650). Station and elevation of PI points and vertical curve lengths were fed into the computer to produce the centerline elevation for each station at which a terrain cross section was taken.

A second pass through the computer, utilizing design template data, centerline geometrics data and the terrain elevations, produced complete coordinates of the design cross sections, including sections requiring superelevation, changes in width and variation in cut or fill slope.

The third pass utilized the design cross section and the terrain data to produce earthwork quantities and the mass diagram (the latter is plotted automatically on the line plotter directly from output cards from the electronic computer).

These three computer steps were processed at a rate of 1½ hours per mile (cross sections at 100 ft intervals). Three grade lines, or a total of 28 miles of road, were tried before a final profile was chosen (the line remained as recommended in the route location phase). The computer handled the "refining" passes even faster than the initial earthwork elevations since the design templates were already developed. Computer time for these succeeding runs averaged 40 minutes per mile.

Indeed, refinement of the earthwork balance continued to within two weeks of the date final plans were submitted for several of the project sections. The refinement process saved 110,000 cu yd of earth moving comparing the earthwork over the entire 11.2 miles as obtained using the grade arrived at during route location and as finally designed. Total excavation on the job amounts to 1.8 million cu yd.

• **Plotting cross sections**—With the most economical line and grade decided, the punched cards containing the terrain and design cross section data were fed into an automatic line plotter. When this machine was placed in operation by Photronix in October, 1957, it was the first line plotter in operation (now about four others are in use in the U. S.).

The plotter simply reproduces cross sections automatically, in colored ink on graph paper to any desired scale. (The Indiana cross sections were plotted at 1 in.=10 ft.). It also shows a datum lined (but does not print numbers such as elevations or station numbers).

The cross sections for U. S. Route 136 were studied by the consultant for necessary modifications, such as for benches in cut slopes, special ditches etc. Some 200 sections were changed.

After all revisions were made, the changes were incorporated in final runs through the computer and plotter. The final set of cross sections were inked directly on standard Indiana cross section paper by the line plotter and, were included in the construction plans.

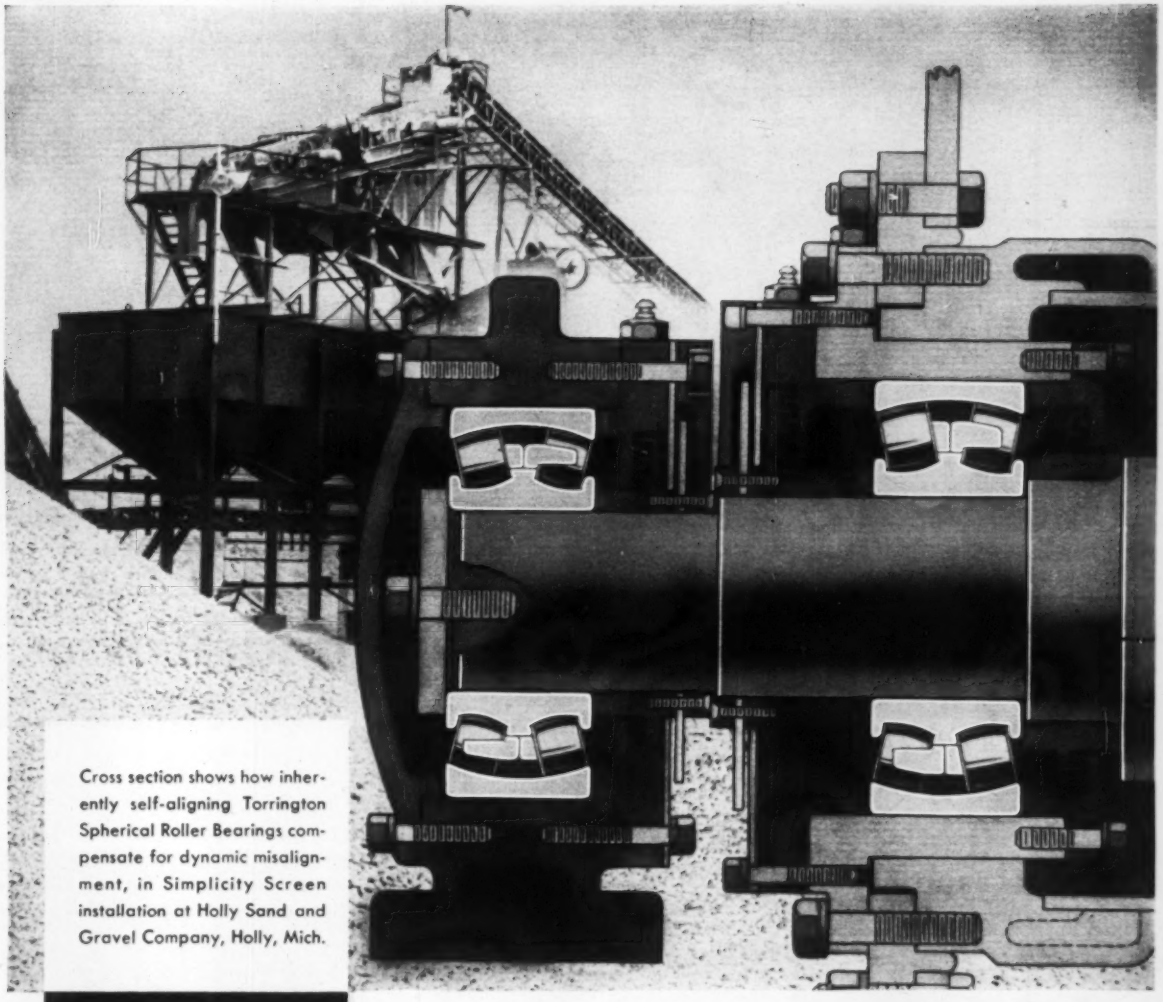
• **Final plans**—Twelve weeks after design authorization was received, the consultant submitted a right-of-way plan for the Wabash River bridge. Tracings were submitted four weeks later.

As designed after study of eight structure types and span arangements, there are two 36½ ft wide, 1,327 ft long bridges whose centerlines are 74 ft apart. East and west approach spans are 380 ft long, supported by continuous rolled sections. Five river spans totaling 566 ft (maximum 125 ft) are each supported by two 7 ft deep continuous plate girders.

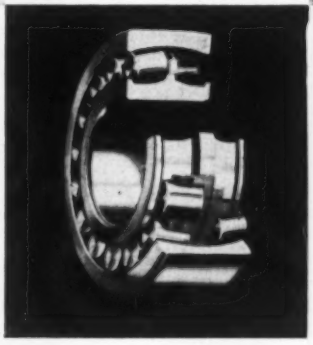
Final prints for the road projects were submitted during the 18th, 19th and 20th weeks after design began.

The Indiana state highway opened bids for the Wabash bridge on April 29 and awarded a contract in the amount of $1.6 million to Traylor Bros., Inc., of Evansville, Ind. With the bridge under way, bids were opened July 29 on the 2.4 mile road section split by the Wabash bridge. This contract has been awarded to S. J. Groves & Sons of Minneapolis for $1.2 million.

For the consultant, E. S. Preston was in over-all charge, with W. W. Jones as project engineer. George M. Foster, executive director, and Carl E. Vogelgesang, chief engineer, represented the Indiana state highway department. H. G. Oakes is BPR division engineer in Indiana.



Cross section shows how inherently self-aligning Torrington Spherical Roller Bearings compensate for dynamic misalignment, in Simplicity Screen installation at Holly Sand and Gravel Company, Holly, Mich.



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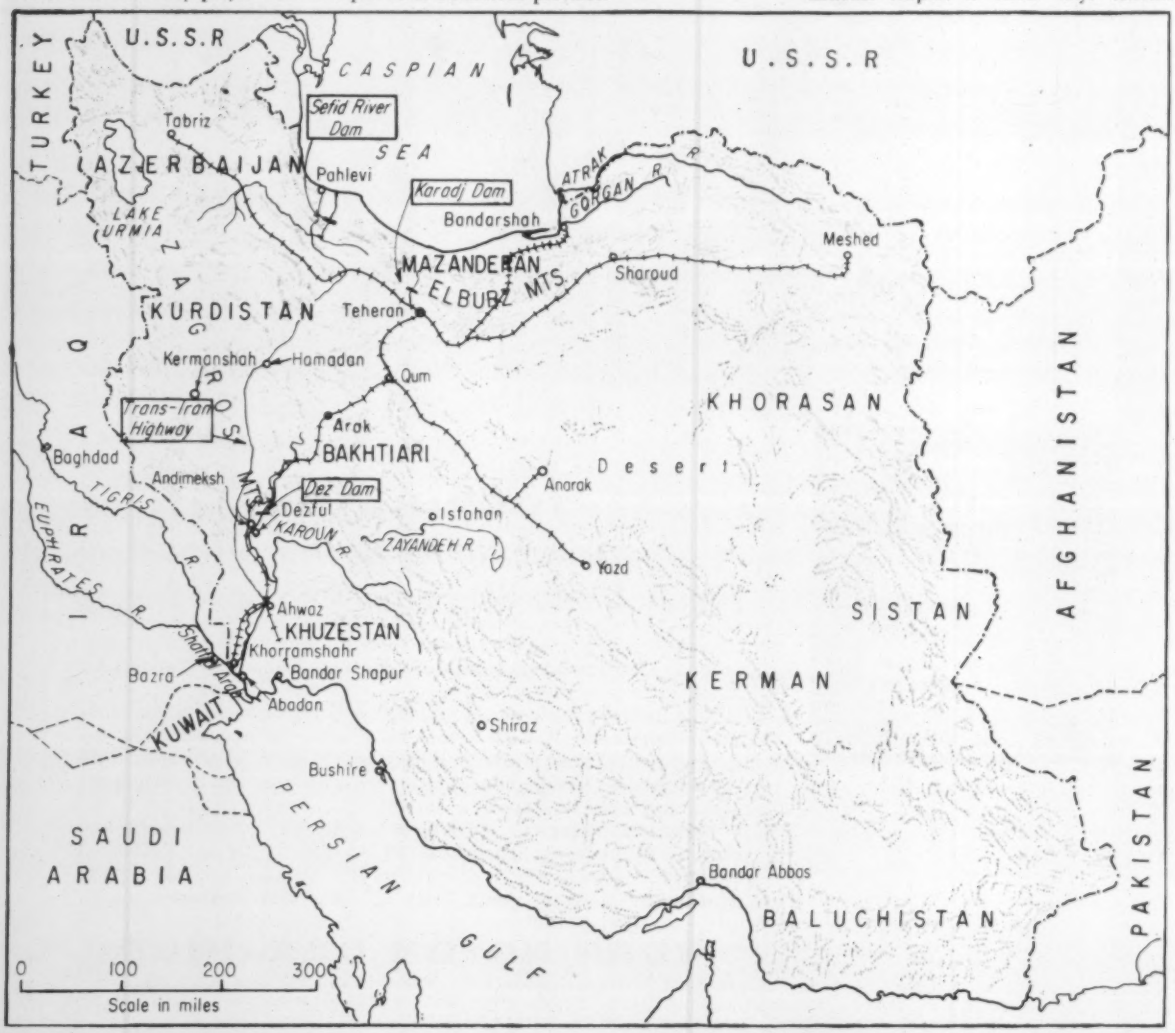
FIRST THINGS FIRST in Iran requires constructing of this cement plant to supply Dez Dam, in turn the key project for development of Khuzestan province.

MODERNIZATION of Teheran's International Airport is under way. Another



IRAN is a great central plateau rimmed by high, rugged mountains plus an alluvial plain in the southwest. The development task for such an area focuses on communications and water. Some of the important current projects are shown on the map.

international airport and four major local fields are also being built.

STEPPED MASONRY COFFERDAM will divert river through tunnels (inlets at upper left) to permit construction of Sefid Roud Dam in northern Iran.

Construction Spotlight Shifts to Iran

O. M. Marashian
Middle East Bureau
McGraw-Hill World News

Nearly every week a new name plate goes up on the wide avenues and tree-lined alleys of Teheran, bustling capital of Iran. These are the plates of consultants and contractors from many lands—the United States, Scandanavia, Western Germany, Italy, France, Belgium, Switzerland and Japan—who come to Iran to take part in the country's stepped-up construction effort.

Only a beginning has been made, but already three major dams are under way, rail lines have been extended, ports are being improved, designs for a 750 mile north-south highway are in process and several irrigation systems have been completed. And of greatest significance is a regional development program for the whole southwestern corner of the country in the Iranian province of Khuzestan.

Among Middle Eastern countries, omitting India, only neighboring Iraq (ENR Dec. 12, 1957, p. 34) has tackled the development problem with as much vigor and comprehension as Iran. And now with Iraq's program in temporary eclipse because of its political upheaval, Iran's activities take on new significance and command top interest. At least, there can be no doubt that Iran is still oriented toward the West; until Iraq spells out what she means by "neutrality," the same cannot be said of her.

• **Comparing the programs**—Inevitably, however, Iran's plans for development invite comparison with those of its next door neighbor. Both Iran and Iraq have oil, which sets them apart from such other Middle Eastern countries as Egypt, Syria, Lebanon, Turkey, Afghanistan and Pakistan, as being able to finance the bulk of their development needs. Both countries also have the land and the untapped natural resources to accommodate a far greater population than at present.

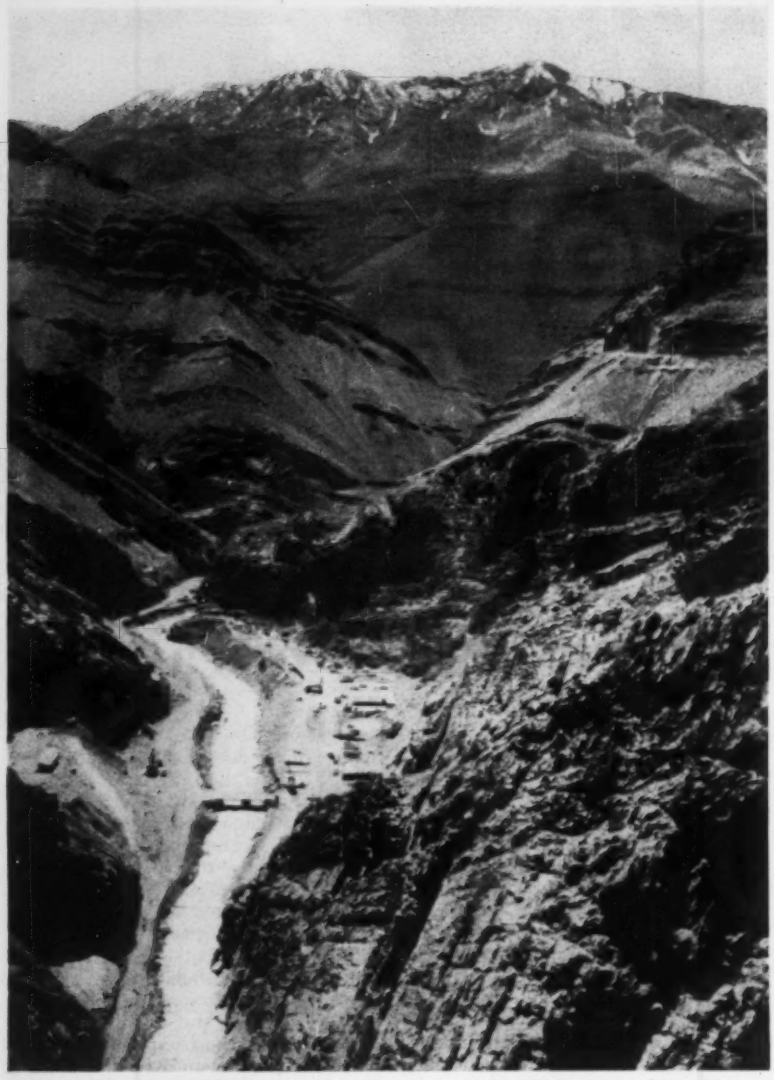
Here, however, the close similarity ends, for Iraq has an abundance of water, while Iran is much less blessed in this respect. And although Iran's 628,000 sq mi make it nearly four times as large as Iraq, its potential farming acreage is not much, if any, greater. The Elburz mountain range across the north edge of the country, the Zagros range along the west and the south and a great interior plateau that is mostly desert make Iran's development task more formidable than Iraq's. At the same time, Iran has greater potential mineral resources than its neighbor Iraq.

Both in Iraq and Iran, however, the development plans cover almost every field of human endeavor. In Iraq the agency charged with the program is called the Development Board. In Iran, it is the Plan Organization. The Development Board, at least before the revolution, received 70% of the country's oil revenues, which theoretically gave it $1.4 billion to spend over the next five years. In Iran the Plan Organization is assigned 60% of the oil revenues, on the basis of which a seven year development budget of $1.137 billion has been set up.

Prior to World War II, both countries had made a start on development, but not on a comprehensive plan basis. In Iraq, under the guidance of the British, flood control above Baghdad and some scattered irrigation developments below the city were begun. In Iran, Reza Shah, the present shah's father, turned Teheran from a dirty, provincial town toward the beginnings of a modern city. But his major accomplishment was the completion in 1938 of the Trans-Iranian Railway. It runs for 865 miles from the port of Khorramshahr on the Persian Gulf to the port of Bandar Shah on the Caspian Sea. This job represents one of the world's remarkable construction operations. Crossing passes in both the Elburz and Zagros ranges at elevations of 7,000 ft, it contains 190 tunnels aggregating 47 miles in length and hundreds of masonry bridges.

The railroad was built by the Danish consortium, Kampmann, Kieruluff & Saxild, known as Kampsax, and gave valuable service to the Allied cause in World War II, during which more than 5 million tons of war supplies were moved over it to Russia.

• **Iran's Plan Organization**—But these pre-war activities were not in the same pattern as today's comprehensive programs, stemming from Iraq's Development Board, formed in 1950, and Iran's Plan Organization, which got Parlia-



CONFINED QUARTERS for construction camp at Karadj Dam are best obtainable in the rugged canyon. View is downstream from top of actual dam location.

ment approval of its first seven year plan in 1949. Actually Iran's planning started three years earlier when the present shah, Mohammed Reza Pahlevi, set up a Supreme Planning Board to explore methods for using the country's oil revenues for development purposes. The board hired the Morrison-Knudsen Co. of the U. S. to study its proposed program and prepare a justification report for loans from the World Bank. Out of this came the Plan Organization and a first seven year program.

Not much construction progress was made, however, and when the country nationalized its oil industry under the ill-starred premiership of Mohammed Mossadegh, even planning stopped. What helped Iran weather the crisis during this period was U. S. aid—$60 million as an emergency contribution and another $70 million in technical assistance.

By 1954, however, the shah had regained control of his country, and he immediately placed an able administrator, Abol Hassan Ebtehaj, former governor of the Iran Central Bank and Iranian governor of the International Monetary Fund and the World Bank, at the head of the Plan Organization. After clearing up the financial chaos in the Organization, Mr. Ebtehaj scrapped the first seven year plan, and carefully laid a foundation for the second seven year plan, which is now under way.

According to the Plan Law, passed by Parliament, the Plan Organization can borrow from domestic and foreign banks and international agencies, and obligate future oil revenues for repayment of these loans. It is not an executive body, but it will plan, study, finance and supervise specific projects. Furthermore, projects can be carried out in one of three ways:

1. By existing government departments—and almost half of the Plan Organization's funds are channeled in this direction.

2. By consulting engineers—either for projects that are outside the normal functions of government departments or are too complex or too big for them to handle.

3. By private organizations—mostly in the industrial field where the Plan Organization's technical and financial assistance can be useful.

Plan Organization officials hope their projects in water resources, communications and industry will create the necessary incentive and develop the country's resources sufficiently to enable private investment to step in and take over. Until that day comes, however, the Plan Organization will run the country's economic show.

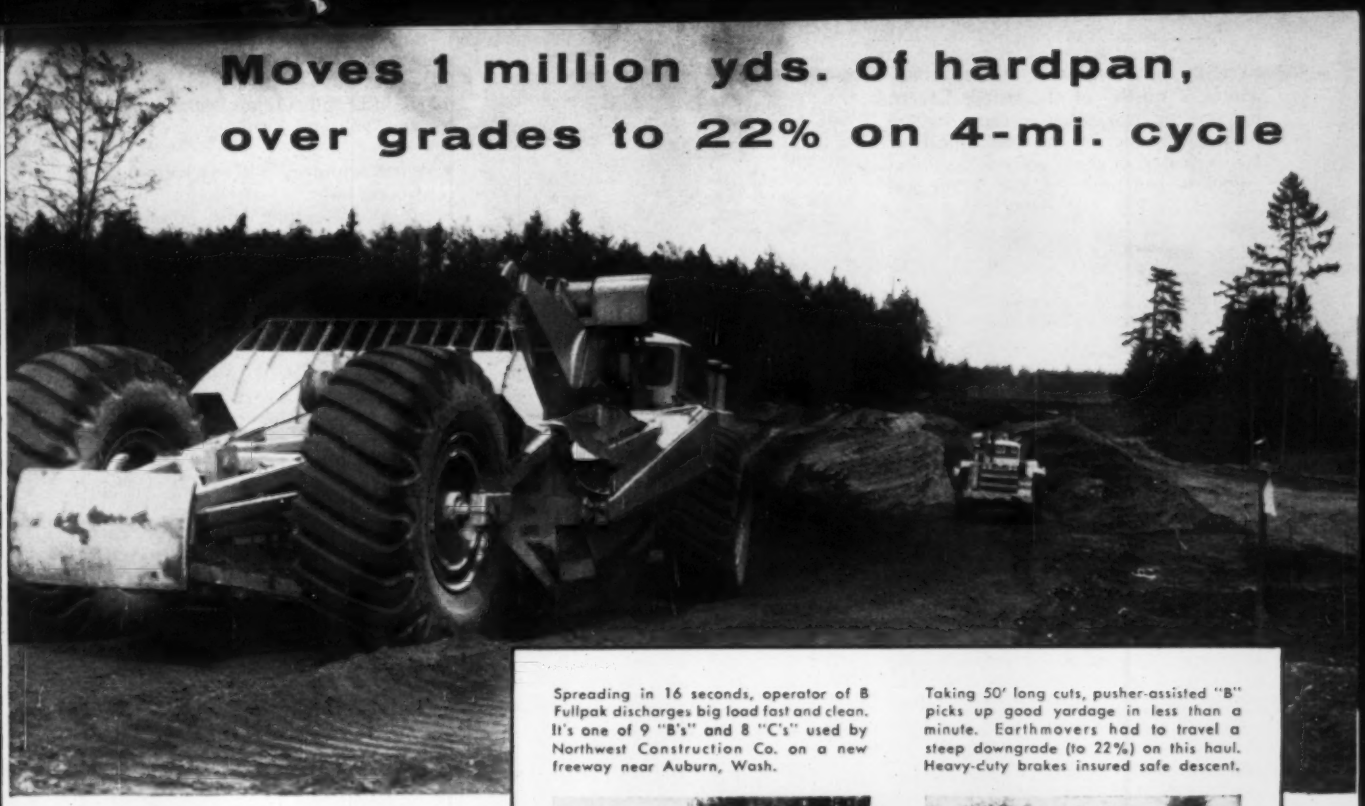
In addition to its managing director, the Plan Organization has a High Council of seven members acting as a board of directors, and a technical bureau, in which foreign experts, recruited by the World Bank, assist Iranians in over-all supervision and control of the projects.

• **Budget and revenues**—The total budget for the Second Seven Year Plan is $1.137 billion dollars, allocated as follows: 34.5% (about $392 million) for communications; 25.7% ($292 million) for agriculture, including water resources; 15.2% ($172 million) for industry and mines; 20.5% ($233 million) for social services, including municipal projects, education and health; and about 4% ($46 million) for administrative expenses.

Direct oil revenues in 1957 were $213 million, and will be even higher this year. In addition to the invaluable help of the U. S. Operation Mission in Iran (Point Four) the Plan Organization is also counting on a fresh money commitment by the U. S. of a further $40 million this year. Finally, it is seeking another World Bank loan of $45 million and has applied to the U. S. Development Loan Fund for another $40 million.

• **The program's essentials**—Basically, Iran's development program is dictated by its topography. The great central plateau at a 3,000 to 5,000 ft elevation is ringed with high mountains cut by narrow, steep valleys, often blocked at the ends. The center of the plateau is useless salt swamp and loose sand, so that most of the people live in or near the mountains where communication routes range from poor to non-existent. Also, there is only one

Moves 1 million yds. of hardpan, over grades to 22% on 4-mi. cycle



Spreading in 16 seconds, operator of B Fullpak discharges big load fast and clean. It's one of 9 "B's" and 8 "C's" used by Northwest Construction Co. on a new freeway near Auburn, Wash.

Taking 50′ long cuts, pusher-assisted "B" picks up good yardage in less than a minute. Earthmovers had to travel a steep downgrade (to 22%) on this haul. Heavy-duty brakes insured safe descent.

Now open to motorists in the state of Washington is a new freeway which links busy U.S. Hwy. 99 with the city of Auburn. Recently completed, this new traffic artery speeds travel from Tacoma to North Bend and Snoqualmie Pass. It also constitutes the main east-west connection with U.S. 99 between the cities of Tacoma and Seattle.

Northwest Construction Co. of Seattle had the contract for grading 4 mi. of the freeway and constructing a bridge. The firm agreed to move the million yds. of hardpan in 13 months. Seventeen scrapers worked on the project — all LeTourneau-Westinghouse — including 8 C Tournapulls®, and 9 new B Tournapulls with Fullpak® scrapers.

Haul hardpan over hilly 4-mi. cycle

Push-loaded by a heavy crawler, the "B's" averaged 18-yd. payloads in the tough, rock-like hardpan — according to Supt. John Vineyard. Loading time averaged less than one minute, over a 50′ distance.

Leaving the hilltop cut, the big B 'Pulls* hauled about 800′ down a steep 22% grade to the slightly sloped main haul road. Here the heavy disc-type brakes, plus auxiliary non-wear Electrotarder braking system on these big earthmovers, assured safe descent of capacity loads at time-saving speed.

The haul, over a 2-mi. temporary road, was covered in 10 to 11 min. in 3rd gear, at an average speed of 11.5 mph. Fill was spread at the base of the bridge and at low spots on the road-bed. Electrically-controlled, positive-ejection tailgate cleared the bowl quickly of its load. Spread in 100′ on the fill took only 16 sec. Total time for the hilly 4-mi. cycle averaged 22 min., 34 sec.

Liked first 8 Fullpaks bought 9 more!

"These Fullpaks are fine rigs," said Don Fiorito, co-owner of Northwest Construction Co. "We bought 8 C Tournapulls in 1956 and 9 Model B's a year later."

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river in the southwest, the Karoun, which is worthy of the name. Except for one or two other streams in the north and one in the east, most of Iran's water courses are in dead-end gorges or run out onto the desert and disappear.

Under these circumstances what Iran needs first and foremost is communications. Second is water, put where it is needed.

As the budget figures show, the biggest item is 34.5% for a comprehensive communications program. Of the $392 million involved, nearly $100 million has been spent in the last two years, in this manner: railroads, $40.7 million; roads, $32.9 million; ports, $10 million; airports, $6.4 million; telecommunications, $5.9 million; and topographical surveys, $1.5 million.

• **Railways**—In April the Shah inaugurated the final 225 miles of the line to Tabriz west of Teheran, and also the 327 miles of main line and sidings between Shahroud and Meshhed, linking Tehran to the isolated easternmost towns near the Russo-Afghan border.

Under construction now is a spur from Tabriz to the Turkish border. In addition, 250 miles of line between Andimeshk and Arak, future industrial center of Iran, are now being replaced with heavier rails. Of this, 185 miles have been completed.

• **Highways**—Roads are the weak point in Iran's development efforts, so far, and the Plan Organization seems well aware of it. Of the 13,500 miles of roads in Iran today, only 1,275 miles have any semblance of a hard surface. Some 5,400 miles of new roads are to be constructed or completely rehabilitated under the plan. So far the Ministry of Roads has completed 363 miles.

A major contract given to a British firm in 1955 for the construction and repair of 3,750 miles of highways within eight years was canceled last December, because of lack of progress. The Iranians concluded that awarding such large contracts was a mistake. That's why contracts for the survey, designs and specifications of the new 750 mile north-south Trans-Iranian Highway recently went to three different consulting engineers. The highway will start at the Persian Gulf port of Khorramshahr and end at Pahlevi on the Caspian coast.

A West German firm (ETCO) and an Italian firm (SAUTI of Milan) got the contract for 187 miles each on the north and south ends of the highway, while Ammann & Whitney, New York City, got the contract for the 375 mile mountainous central section, north from Andimeshk.

Two separate contracts also were awarded last year to Kampsax of Denmark, one for the construction of 380 miles of roads in southern and western Iran, and another for 250 miles in the north and northwest.

INCLINED DIORITE STRATA is characteristic of the geology of the Karadj damsite.

• **Seaports**—The Plan Organization also has engaged Kampsax for large-scale improvements of the two Persian Gulf ports of Khorramshahr and Bandar Shapur. Construction is now under way by Iranian contractors, and completion of both is expected in 1960.

Khorralmshahr, Iran's congested major port on the Shatt-el-Arab River, is being extended at a cost of $30 million, to increase storage capacity and quay area. When completed in two years, the port should handle over 800,000 tons of freight annually, double its present capacity.

At Bandar Shapur, where tidal flats shelve off abruptly into a deep channel, the problem is to provide firm ground on which to build a town, warehouses and wharves from which 500,000 tons of freight can be handled annually. Unfortunately, the mud in the river is too thick and sticky to be pump-dredged, so that fill for an area of some 700 acres has to be hauled from higher ground about nine miles away. About half of this fill is now in place behind dumped rock embankments.

• **Airports**—The Plan Organization recently took the entire responsibility for constructing civilian airfields throughout the country from the Civil Aviation Department. It chose the firm of Brian Colquhoun & Partners to design the two international airports—at Teheran and Abadan—and also four major local airfields of Isfahan, Shiraz, Kermanshah and Yazd.

• **Water resources** – Conservation and controlled water use are the other major needs of Iran along with communications. Average rainfall is only 11 in. a year, most of it in the northern provinces. Of the 628,000 sq mi in the country, nearly half is desert and waste. Only 200,000 sq mi are arable, and of this only about a third is farmed.

It will never be possible to develop the two deserts for agriculture or industry, but a system of dams can give the arable lands that border them, as well as other potential farm areas, a controlled supply of water. The steep canyons in the mountain are ideal for the construction of dams, and the Second Seven Year Plan has provided $92 million for the purpose.

The real importance attached to water resources by the Plan Organization is demonstrated by the fact that it has now engaged 10 consulting engineers for dams, reservoirs and irrigation systems throughout Iran. Among these are the Harza Engineering Co., Chicago, and Justin & Courtney, Inc., Philadelphia. The others are French, British and Dutch. These firms are now engaged in studies looking to future construction, as follows:

(1) In the Teheran area and the Mazanderan province, north of the city, basic studies on several rivers have been completed by Sir Alexander Gibb & Partners of London, with the conclusion that the construction of two dams on one stream and one on another is justified.

(2) In Azerbaijan province in the region of Tabriz, studies are complete for a 400 ft dam, with a 220,000 acre-ft reservoir to irrigate 150,000 acres.

(3) On the southeastern coast of the Caspian Sea, studies on the Gorgan River point to the possibility of two storage dams to irrigate an additional 60 sq mi of farmland.

(4) On the Zavandeh Roud, flowing eastward out of the mountains past Isfahan to the desert, two sites for a dam are now under consideration. The dam probably will have a height of 300 ft and a reservoir capacity of 500,000 acre-ft for irrigating 100,000 acres and serving a 28,000 kw power plant.

(5) In the south, near Shiraz, preliminary studies have been completed for Dorudzan Dam, to be 160 ft high and 1,800 ft long, with an estimated reservoir capacity of over 665,000 acre-ft and generating capacity of 21,000 kw.

(6) On the Karoun River above Ahwaz, in southwestern Iran, Justin & Courtney is completing studies for the Gotwand Dam for municipal water supply and irrigation.

packed a heaping load into its low, wide bowl. 210 hp C 'Pull* loaded up to 16 pay-yards in 56 sec.—completed average 1840' cycles in 4 min. 24 sec. Contractor Robinson who has

"I really like that Fullpak—especially on land-leveling where it shows up good. Often it will self-load profitably in this type of work, and the dirt really boils in. She sure moves the dirt!"

How midwest contractor converted 160-acre farm into Omaha subdivision

Preparing 160 rolling acres of farmland for a subdivision site for Rogers Construction Inc. was a recent project for Willard L. Robinson Construction Co. of Omaha, Nebraska. The job required moving approximately 500,000 yds. of earth in 1955-56, and 250,000 yds. of earth in 1957 to build city streets and level land for new homes. Contractor completed many land-leveling jobs in the area, so he knew from experience that his equipment could handle the job *fast* . . . at good profit.

Robinson's earthmoving fleet includes 3 C Tournapulls®—one with an 18-yd. Fullpak® scraper, and two with older 16-yd. scrapers; 1 D Tournapull with 7½-yd. scraper, 2 C Tournatractors®, and a big 150 hp Adams* 660 grader.

Some of the reasons why contractors choose mobile, high-speed LeTourneau-Westinghouse earthmoving equipment for their operations are illustrated in the examples shown here. Why not find out how these profit-making tools can *help* you? Call or write for complete information and let us arrange for a demonstration.

*Trademark CTCPDPG-1643-DCJ-1

Robinson Construction's Adams 660 is shown spreading clay and loam fill in 3rd gear (4.7 mph). Grader also cleans up cut and smooths haul road to permit safe, profitable speed by scrapers. "660", equipped with 15 gear-ratios (including 3 creepers), gives operator the balance of power and speed to handle every grading job at top efficiency.

Another valuable asset in the Robinson spread is their 7½-yd. D Tournapull. This 138 hp self-loading tool profitably handles scattered, small-volume dirtmoving. And on big production jobs, unit works efficiently in the line up with their larger scrapers. Here, "D" is shown speeding back to cut. Fast return helped D 'Pull complete 645' load-haul-and-spread cycle in 1 min. 51 sec. Delivering average 6 pay yds. per load, unit hauled 180 yds. per hour. (Present improved model D Tournapull—with 9-yd. heaped capacity—gives you even better production. Only 8' wide and within 9-ton axle weight limit, unit roads without permit.)

When not push-loading scrapers, fast-stepping Tournatractor handled miscellaneous dozing jobs all over the 160-acre site. On job-to-job moves, mobile, rubber-tired Tournatractor saves contractor time and expense of truck-trailer transport. Tournatractor always drives via the *quickest*, most direct route to any assignment. Unit's big, low-pressure tires do not damage pavement, curbs, sidewalks, or RR tracks.

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

DEZ DAM will block this deep narrow canyon in southwest Iran with a 620 ft high arch. At right a footbridge is being placed across the river.

While these studies are under way, however, three major dams are actively under construction—Sefid Roud and Karadj in the north, and Dez in the southwest, the latter as a part of the comprehensive regional development scheme in the province of Khuzestan.

• **Sefid Roud Dam**—This multipurpose concrete gravity dam got off to a slow start in 1955, but work has accelerated recently. Situated on the Sefid Roud (White River) in the northwest, the dam will be 335 ft high, 1,400 ft long and 330 ft wide at the base. Designed to store 1.4 million acre-ft to serve a power plant of 64,000 kw capacity, the dam will also make possible the irrigation of 300,000 acres on the tea-growing plain along the Caspian coast.

Consultant and contractor on the dam is the French consortium SASER, made up of Etablissements Billiard, Entreprises Campenon Bernard, and Societe Anonyme Hersent, all of Paris.

Main access roads and bridges at the damsite have been completed, and nearing completion are the two diversion tunnels, the cofferdam, and the living quarters for the engineering staff and workmen. The contractors will start placing concrete in the dam itself in December this year. To supply the cement for the dam, a British firm (Henry Pooley & Co.) is now erecting a cement plant near the damsite. It will have a daily capacity of 300 tons.

• **Karadj Dam**—About 40 American and Iranian engineers and 2,300 men are now working three shifts on Karadj Dam (ENR Dec. 19, 1957, p. 56) located in a deep, narrow canyon 25 miles northwest of Teheran and destined to provide additional water supply for Iran's booming capital. Morrison-Knudsen-International Constructors, Inc., has the $41.5 million contract, and Harza Engineering Co., International, of Chicago, designed the project and is now furnishing engineering supervision at the damsite.

The most interesting feature of the work so far is the tunneling required to prepare the steep-sided canyon site for dam construction. Even the job water supply, obtained from springs, has to be stored in an excavated cavern. In addition, in relocating 10 miles of the highway, which connects Teheran to the Caspian Sea through the bed of the Karadj gorge, to high on the canyon wall, the contractors had to drive eight tunnels, totaling 2.5 miles in length. And, finally, there was the diversion tunnel, 16 ft in diameter and 1,220 ft long. All of this work has been completed.

At present the contractor is excavating on both abutments, completing the spillway excavation and upstream cofferdam, and building the construction plant and the power plant access road, on which three more tunnels are required. Work is also under way for the cableway installation.

Karadj Dam will be a double-curvature arch, 590 ft high and 1,280 ft long, requiring 915,000 cu yd of concrete. It is founded on a gray, coarse-grained diorite sill, which dips at an angle of 42 deg. A 51,000 cfs chute-type spillway will be located in the right abutment, while a power plant, with space for three 40,000 kw generators, will be constructed below the dam.

Besides supervising the dam construction, Harza is carrying on a training program for Iranian engineers. Erik Rettig is resident manager at the damsite, and Hjalmar Gericke is deputy resident engineer. E. C. Shipp is project manager for Morrison-Knudsen.

• **Dez Dam**—First major river control structure of the Development & Resources Corp., New York, the Plan Organization's regional consultants for the once-fertile Khuzestan province, is Dez Dam. It will be located in a 1,400 ft deep canyon of the Dez River, 15 miles north of the town of Dezful. Dez Dam will be a thin concrete arch 620 ft high. It is the first of 13 multipurpose dams now being studied for the five rivers in the province.

The Dez River rises in the Bakhtiari mountains of the Zagros range and follows a southerly course, finally joining the Karoun River above Ahwaz, capital of Khuzestan. After leaving the high mountains, the river flows through 25 miles of rough but relatively open country, then suddenly enters a narrow canyon with perpendicular walls over 1,400 ft. high. The open country provides the reservoir for the dam, which is located three miles below the canyon's upstream entrance. The geologic formation at this site is a calcite conglomerate consisting of large-sized cobble firmly cemented in a hard matrix.

In dry years, the dam will provide the full irrigation requirements for 425,000 acres. In the past, floods on the Dez and Karoun Rivers submerged lands between Ahwaz and Khorramshahr—including the only road and rail communications—for as many as 100 days in a year. The reservoir will be able to control four-fifths of the entire Dez drainage area and up to 70% of the Karoun River floods at Ahwaz. Also, by controlling the wide fluctuations in the river flow on the lower Karoun, the dam will help navigation and at the same time reduce the silting of the Shatt-el-Arab, into which the Karoun

Instant-acting electric motors lift apron high, shoot tailgate forward for quick spread on Ford Ord, Calif. clearing and leveling job handled by contractor Phil Calabrese. Spread took average of 12 seconds, with some as low as 7 seconds.

"TERRIFIC" says Phil Calabrese

"A terrific machine!" is the way contractor Phil Calabrese, Monterey, California, describes his LeTourneau-Westinghouse C Tournapull® with 18-yd. Fullpak® scraper. "It moves a lot of dirt fast," he says, "and works in any material."

Typical of the big-volume performance that's made a Fullpak fan of Phil Calabrese is the way his "C" packed in dirt on a recent land-leveling job at Fort Ord, Calif. Clearing a 12-acre site for a new army chapel, the firm had to move 28,000 cu. yds. of root-laced topsoil and sand loam.

3 min. average for 1,000′ cycles

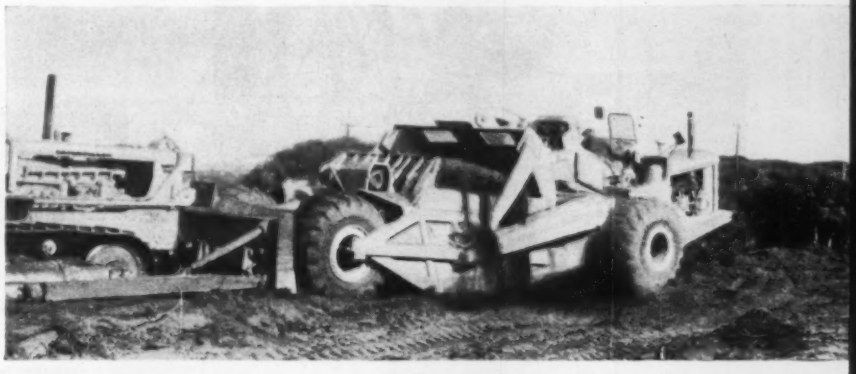
Push-loaded down a 4% grade, the low, wide Fullpak scraper averaged big-capacity loads . . . ran through 1,000′ cycles in less than 3 minutes. Load-time, over 145′, was 48 seconds. Spreading, in 60′, took only 12 seconds. The 282′ return was traveled in just 30 seconds.

Fill areas on the project were soft and spongy, but the C 'Pull* had no trouble getting traction. Whenever wheels started to spin, operator merely flicked dashboard steering-switch alternately left and right. This activated electric kingpin-steer motor, pivoting prime-mover side-to-side — until at least one drive-wheel reached solid footing. From there, L-W's exclusive power-transfer differential applied up to 80% of tractive effort to that wheel, and kept pulling the machine forward.

L-W service pleases owner

Contractor Calabrese is "sold" not only on his L-W machine, but on L-W service as well. Wherever you live, wherever you work, you will find a nearby LeTourneau-Westinghouse Distributor who is proud of his equipment and ready at all times to give the owner prompt and dependable service.

Call *your* LeTourneau-Westinghouse Distributor for practical answers to earthmoving equipment problems. You'll find his fast, rubber-tired L-W machines . . . all competitively priced . . . can do more jobs faster, at lowest-net-cost-per-yard.



"Wonderful machine" is what operator Winston Cassey calls new C Tournapull. He adds: "It's easy-loading and has really good visibility."

*Trademark CP-1563-DCJ-1

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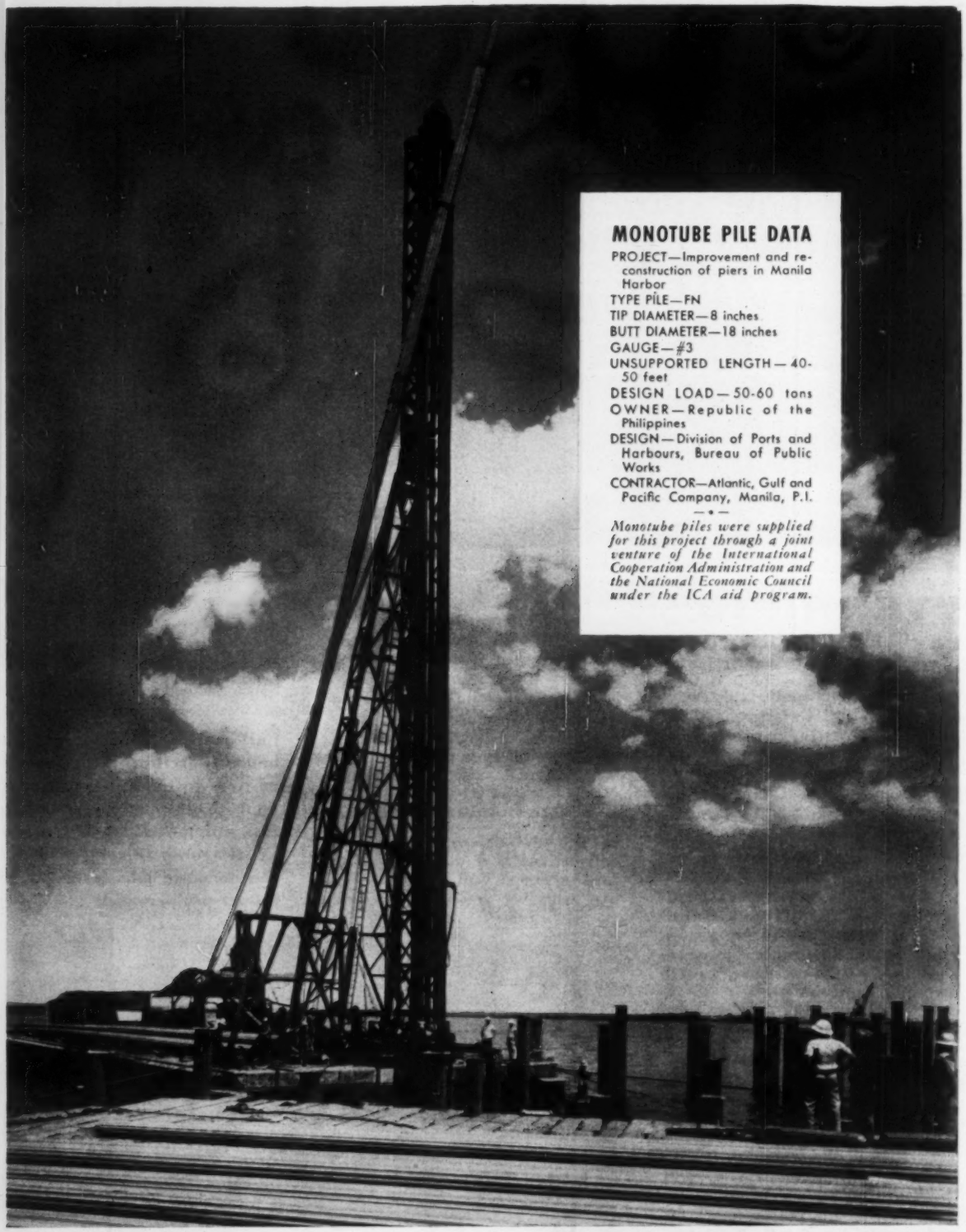

MONOTUBE PILE DATA

PROJECT—Improvement and reconstruction of piers in Manila Harbor
TYPE PILE—FN
TIP DIAMETER—8 inches
BUTT DIAMETER—18 inches
GAUGE—#3
UNSUPPORTED LENGTH—40-50 feet
DESIGN LOAD—50-60 tons
OWNER—Republic of the Philippines
DESIGN—Division of Ports and Harbours, Bureau of Public Works
CONTRACTOR—Atlantic, Gulf and Pacific Company, Manila, P.I.

—•—

Monotube piles were supplied for this project through a joint venture of the International Cooperation Administration and the National Economic Council under the ICA aid program.

EASY HANDLING with Monotube piles. The strength, rigidity and light weight of the fluted steel Monotube permits a simple one point pick up of this 140-foot pile. The pile being quickly and easily positioned for driving is one of 4310 piles manufactured by Union Metal for use in the improvement and reconstruction of piers in Manila Harbor.

Tapered, fluted Monotube piles are available in lengths, diameters and gauges to meet every requirement. Write The Union Metal Manufacturing Co., Canton 5, Ohio, for complete information.

UNION METAL

Monotube Foundation Piles

ANT-LIKE workers drill an adit for a tunnel and beach road down the 1,400 ft cliff. Access ladders for the workmen are at the left.

flows, thus benefiting navigation in the Persian Gulf entrance of that river, now used by Iraq as well as Iran.

There also will be a power plant with an ultimate capacity of 520,000 kw, although only two 65,000 kw units will be installed initially.

Preliminary construction for the Dez project already has begun under a contract awarded last February to Morrison-Knudsen International Constructors, Inc. This covers the building of the main access road from the rim of the canyon to the river 1,400 ft below, and the erection of initial camp facilities on the canyon rim five miles above the damsite, which will be expanded later and used by the main contractor of the dam. The access road, scheduled to be finished in September, 1959, will follow a twisting switchback route for more than three miles down the sheer face of the canyon's right wall. Half this distance, including two switchbacks, will be in tunnel. MKI is also improving the 20 mile road from Andimeshk (the Dez project office) to the top of the canyon.

MKI is now surveying a site for a 10 to 15 million gal reservoir on the top of the canyon to which water will be pumped from the river. The MKI contract also includes cost estimates and layout for the construction plant, and, under a separate contract the company has located a suitable quarry from which aggregate will be brought up on a mile of conveyors to the top of the canyon and then hauled by truck for about six miles to the damsite. George Burn is acting project manager for MKI on all this work.

The dam itself is being designed by Electroconsult of Milan, Italy, utilizing the services of A. A. Meyer, former chief civil design engineer of TVA; Prof. Carlo Semenza, member of the management committee of Electroconsult; and Prof. Guido Oberti of the University of Turin and director of the Instituto Sperimentale Modelli E Strutture of Bergamo (ISMES). The latter firm holds the contract for the model testing of the dam.

In New York, design of the powerhouse and spillway, as well as the construction drawings and specifications, are progressing under the direction of the Development & Resources staff. Byrne Associates is doing the drafting work.

The cost of the Dez project is estimated at $59 million, exclusive of irrigation facilities, which are being studied by a Dutch firm, Nederlandsche Heidcmaatschappij, and may cost an additional $50 million. For the Dez Dam work, the Plan Organization is hoping to obtain a $40 million loan from the World Bank later this year.

• **Regional development** — Although Dez Dam is a key project in the Khuzestan province development plan, it is by no means indicative of the far ranging objectives of the scheme, which the Plan Organization has entrusted to the Development & Resources Corp. This firm—formed by two former chairmen of the Tennessee Valley Authority, David E. Lilienthal and Gordon R. Clapp, and the international banking firm of Lazard Freres & Co., to provide planning and administrative services to foreign countries in resource development work—is doing just that in Iran. Its agreements with the Plan Organization, signed in 1956, provide that it plan and help carry out a long-range development program for the 58,000 sq mi Khuzestan region, including investigations and mapping of the resources of the region and the suggestion of key projects. In addition, it is to exercise executive authority over the projects that are selected and, in general, to supervise the entire redevelopment program.

The region, which was the seat of the ancient Persian empire and encompassed its then great cities and extensive irrigation systems, includes the rugged peak and valleys of the Bakhtiari Mountains in the Zagros range, all of Iran's presently exploited oilfields, and the basins of five rivers—the Karkheh, Dez, Karoun, Jarrahi and Hindijan.

The heart of the development program for Khuzestan will be a system of mineral resources. R. & D. engineers estimate a system of dams on these rivers will one day permit the irrigation of 2.5 million acres of land, while power supplies will be adequate for a vast industrial complex.

D & R's operating agency in Iran—the Khuzestan Development Service—based at Ahwaz and headed by A. Lee Smith already has assumed an executive role in carrying out eight selected projects. In addition to the Dez Dam these projects include: a sugar cane plantation and sugar refining plant; a 9 million lb polyvinyl chloride plastics plant (already contracted to Montecatini of Milan, Italy); a natural gas pipeline to provide the PVC plant with the necessary raw material, now being burned as waste at the wells in the Agha Jari oilfields; a fertilizer test and demonstration program; surveys and investigations, including mapping by aerial photography and ground survey work, of the five rivers of the region; soil and mineral surveys; and supervision of power distribution and electrical rehabilitation for 22 towns in Khuzestan, now being carried out by Lichfield, Whiting, Panero, Severud & Associates. What might be called a ninth project is a recent contract with Ibec Housing Corp. of New York City to advise on housing and community needs in the province.

Supplementing these projects, D & R is managing the Khuzestan Energy Authority, established by the Plan Organi-

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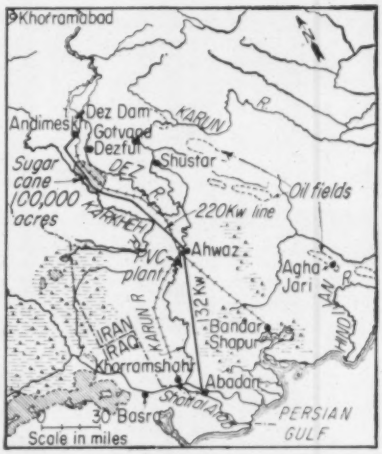

GREATEST DEVELOPMENT is envisioned for this southwest corner of Iran, where water, farmland and oil are plentiful.

zation for the production of electricity and distribution of electricity and gas. Until the Dez Dam power plant goes into service, KEA will buy electricity from the International Oil Consortium's thermal plants at Abadan for transmission to Ahwaz, and early this year D & R awarded a $4 million contract for constructing the necessary 75 mile 2nd 132 kw transmission line to the Societa Anonima Elletrificazione of Milan.

D & R also signed a contract with Nederlandsche Heidemaatschappij of Arnhem, Holland, for a survey of the route of the proposed 220 kv transmission line between Ahwaz and the Dez Dam project. The survey work is expected to be finished in July, 1959, but construction of the line will not begin before 1960.

Robert E. Watts, an American survey contractor, has just finished a survey for the necessary 70 mile, 8 in. pipeline between Agha Jari and Ahwaz, and contract for its construction is scheduled to be awarded at the end of 1958, with Leroy Thompson of Birmingham, Ala., as consultant.

The contractual arrangement between the Plan Organization and KDS is in many ways unique. KDS proposes specific projects to the Plan Organization, which then authorizes their execution by KDS. The latter then awards the contracts, subject to agreement by the Plan Organization. The financial arrangement is also simple. The Plan Organization makes advance payments to KDS in accord with the budget allocations of the Plan Organization. KDS spends from these advances and submits to the Plan Organizing every six months a statement of expenditures—in addition to special and periodic progress reports.

Mr. Ebtehaj and others of the Plan Organization ardently believe that due to the shortage of technical and managerial skill in Iran and the slow-motion routine of government, the contractual arrangement between D & R and the Plan Organization is ideal for Iran's development needs—region by region. "What we need is foreign firms of technicians or managers who can identify themselves with us in our objectives and our struggles—not simply contractors or consultants for hire, but coworkers and partners who, by their deeds, will inspire confidence and trust," said Mr. Ebtehaj recently.

The faith of the Iranians in entrusting foreign firms with regional development plans has been strengthened by the KDS experiment. In fact, the Plan Organization recently signed a one year contract with Italconsult, an Italian firm of consulting engineers, to make a Khuzestan type survey for Iran's forgotten outward provinces of Sistan and Baluchistan, near the Pakistan and Afghanistan borders. A unified development program then will be mapped for this area.

A similar control was signed in July with Ebasco Services of New York City for regional development in Kerma province and other firms are being considered for the other regions of Iran.

• **Municipal development**—Finally, under the general classification of Social Services, the Plan Organization has included construction activity in municipal development and health and educational institutions. For carrying out its municipal development and small town urbanization projects, covering water supply, sewerage, power, public buildings and streets, the Plan Organization has divided Iran into thre general areas of operation, each under the supervision of a consulting engineering firm of a different nationality. The American firm of Lichfield, Whiting, Panero, Severud & Associates has the contract for municipal development in southwestern Iran, including the Khuzestan province, while a West German firm (F. H. Kocks, K. G.) and a French firm (GICOF) are supervising development in the northern and eastern provinces of the country.

Financing is arranged on a 50-50 basis between the Plan Organization and the municipality concerned, but progress has been slow because many municipalities are unable to contribute their share. Nevertheless, some asphalt street paving has been accomplished—about 1 million sq yd in 44 different communities. Also, electrification has started in 42 towns and has been planned in 145 others, especially in the area that is supervised by the U. S. consulting engineers.

The Plan Organization is also carrying out expansion of Teheran University with a number of new buildings.

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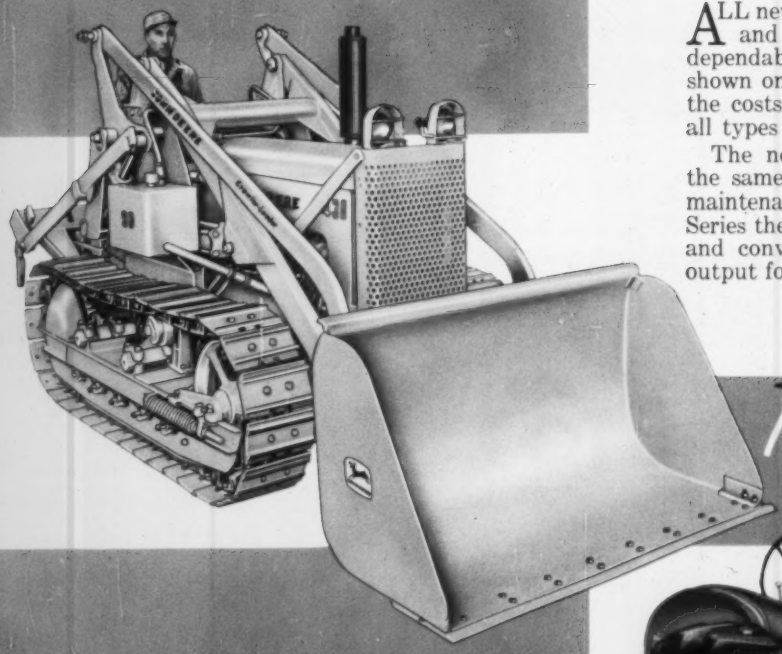
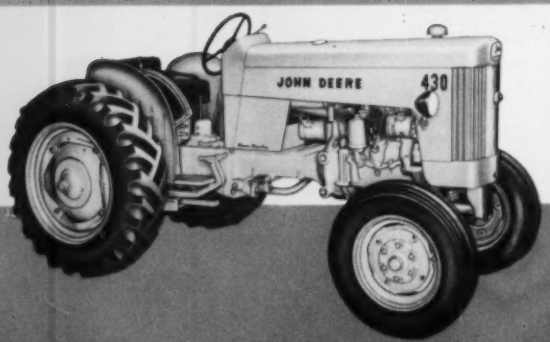


New **430** CRAWLER AND LOADER

New **830** DIESEL



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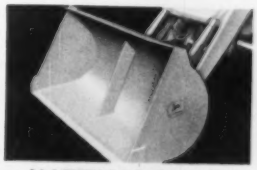
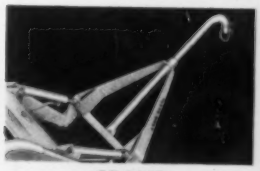
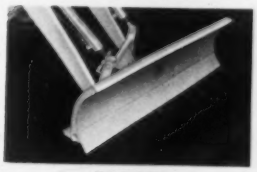
Now—for the time-proved John Deere 71 Loader—a choice of attachments that adapt it perfectly for your particular jobs. Attachments include spill sheet, steel bucket teeth, lifting crane, and materials-handling bucket. Double-acting cylinders of the 71 provide up and down pressure or for operating in float position.



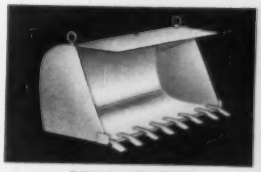
MATERIALS BUCKET



CRANE



BLADE



SPILL SHEET

New "640" Diesel for everyday drawbar work.

New "PIGGYBACK" SCRAPER

The new John Deere-Hancock Tractor-Scraper is a full seven-yard elevating scraper that literally lifts material into the bowl. Loading is fast and complete; controlled ejection is positive—even of sticky clay. Fifth-wheel-type of swivel drive permits operation of the elevator even on 90-degree turns, and large diamond-tread tires assure excellent traction.

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- ☐ Trenchers
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- ☐ Wagons
- ☐ Fork Lifts
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John Deere Industrial dealers all over the United States and Canada stand ready to help you choose the industrial units most economically suited to your requirements, and to give prompt, efficient service.

JOHN DEERE

Flood Alarm Guards Bridge

A two-span bridge and an elaborate flood-warning system today guard against any repetition of New Zealand's worst railway disaster—the death of 151 persons in a flood that engulfed a passenger train as it crossed the Whangaehu River bridge on Christmas Eve, 1953.

The accident was caused by the sudden release of a huge mass of water from a crater lake, which proceeded down the mountain, uplifting large quantities of sand, silt and boulders. The huge wave destroyed a portion of the railway bridge just before the arrival of a passenger train.

The new bridge, now in service at Tangiwai, is a single-track structure. It has two 120 ft steel-truss spans and one 40 ft steel plate-girder approach span. It is supported by three reinforced concrete piers and one abutment on concrete piles. Each pier is composed of two 9 ft dia cylinders, founded 30 to 40 ft below the bed of the river.

The flood-warning system is activated by a series of lead electrodes. They're mounted on a 20 ft high concrete pylon located in the river bed eight miles upstream from the bridge. The electrodes are connected by cable to audible and visual alarms in a nearby railroad station and a control office. When the electrodes are immersed in flood water, the electrical circuit is closed and the alarm goes off.

The system is battery fed to guard against power failure, and so arranged that it will remain operative for more than 24 hours after any failure of power supply. The new bridge was designed by the New Zealand Railways Department.

Oil Firms Spur Venezuelan Construction

Office buildings and apartment houses are rising at a fast clip in Maracaibo and Caracas, Venezuela. Oil companies, faced with a chronic shortage of office space and adequate housing for their employees, are endorsing the new construction.

A Caracas real estate firm, Inversiones Orinoco, C.A., expects to start work late this year on a 16 story office building and six 13 story apartment units in Maracaibo. Half a dozen oil companies are expected to install headquarters in this $15 million "Centro Perolero de Maracaibo," and company employees will occupy most of the 300 or so apartments. Completion is scheduled for the end of 1960.

The project is the latest in a trend to get oil companies out of the real estate business in Venezuela by reducing company housing commitments to employees.

Another "petroleum" center is under way in eastern Caracas. Venezuela Atlantic Refining Co. has signed a lease on an 8 story office building currently

(*International continued page 66*)

WELDED or RIVETED
STEEL PLATE FABRICATION

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★ Boiler Breechings
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★ Tanks and Vats
★ Pressure Vessels
★ Wind Tunnels
★ Crane Bridge Girders
★ Trolley Frames and Trucks
★ Rigid Frames
★ Roll-Over Fixtures
★ Tank Turrets
★ Gun Mounts
★ Heavy Truck Bodies
★ Engine Frames and Bases
★ Crawler Frames
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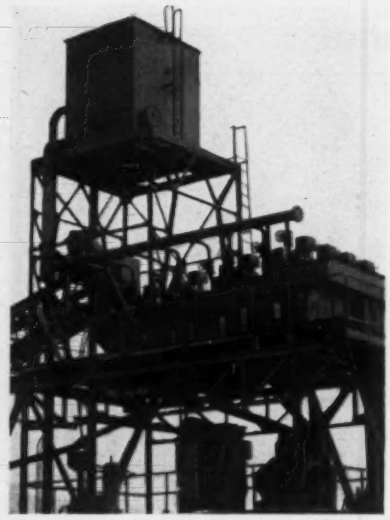
specification sand production in the Japan Alps



Sizer operation was proven out successfully in this pilot plant.

four Dorrco Jet Sizers process 690,000 tons for new dam construction...

The Kansai Electric Power Company has recently started construction of the new Kurobe No. 4 Dam on the Kurobe River, Toyama Prefecture in the heart of the Japan Alps.

The 192 meter high dam will require for completion a total of 690,000 metric tons of specification sand, all of which will be processed by four 16½ pocket Dorrco Jet Sizers. Feed to the units consists of 200 metric tons per hour of river sand and manufactured sand. Accurately sized products down to 200 mesh are dewatered and blended to a fineness modulus of 2.51.

The overall low operating costs — particularly the more effective hydraulic water utilization inherent in the Dorrco Jet Sizer — render the unit ideal for operations in relatively remote areas such as the Kurobe Dam installation.

For complete information on this most effective tool for concentration and sizing of 8 mesh and finer particles in the metallurgical, chemical and non-metallic fields, write for a copy of Bulletin No. 2342. Dorr-Oliver Incorporated, Stamford, Connecticut.

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under construction in that part of the city. And Mene Grande Oil Co. has purchased land for an office building to form part of the development. Plans call for a cylindrical tower of cantilevered, prestressed concrete construction. Socony Mobil Oil Co. de Venezuela is putting up its own $5 million, 8 story headquarters building across the street from the petroleum center.

Cia Shell de Venezuela is moving into rented space; it recently signed a lease on 13 floors of another new building to be put up in Caracas.

India, China Studying World's Largest Hydro

The Central Water and Power Commission of India is reported considering development of a 30 million kw hydroelectric site on the hitherto unexploited Indo-Chinese border. This is the site described at the fifth World Power Conference in Vienna in 1956 as having the largest concentration of power potential in the world.

High in the Himalaya Mountains, the Brahamaputra River takes a U-shaped bend. By driving a 10 mile tunnel across this loop, the Indians figure to develop a 7,500 ft head that can warrant a 30 million kw installation at 60% load factor. It would be a run of river installation, developed for the mutual advantage of India and Red China.

The governments of both countries are now studying preliminary reports. It is expected that Prime Minister Nehru of India will discuss the project with his counterpart in China, Chou-En-Lai, at an early meeting.

Potential of the Indo-Chinese site is slightly larger than the 25 million kw installation now being studied at Inga Falls on the lower Congo River in Africa (ENR July 18, 1957, p. 62). Here, a flow of about 1 million cu ft per second can be harnessed over a 300 ft head. Flows at the higher head Asian site are on the order of 65,000 cfs.

Roads to Exploit Resources Now Being Built in Canada

Construction started recently on the first leg of a 525 mile all-weather road in Saskatchewan. The $16 million road is being built under the "Roads to Resources" program of federal subsidies to provinces on a 50-50 basis. It will run from a railhead near Prince Albert to Uranium City, off Lake Athabaska.

Another road under the program is well under way. It is a 212 mile stretch from Prince Albert to the mining city of Flin Flon. Estimated cost is $3.5 million and construction time 2½ years.

Sitting pretty with low cost Kaiser Aluminum railings

Kaiser Aluminum bridge railings offer important money-saving advantages other materials can't match.

First, Kaiser Aluminum railings weigh less. A typical 10-foot extruded section of Kaiser Aluminum weighs 132 pounds *less* than its steel counterpart. Lightweight Kaiser Aluminum railings are easier to fabricate—go up fast—save on labor costs. They're easy to weld, too.

Second, Kaiser Aluminum railings resist corrosion, can't rust, never need painting, keep their handsome appearance. Maintenance costs are sharply reduced.

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- Extruded & Sheet Sign Components

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Kaiser Aluminum does not fabricate or erect bridge railings, but supplies railing components. We invite the opportunity to bid on fabricator-erector requirements. We will also be glad to provide technical assistance on the design and specification of aluminum bridge railings and other highway products.

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In Canada — Terry Machinery Co., Ltd.

LeTourneau's giant scraper has a capacity of 50-60 cu yd

New Scraper Is World's Biggest

Electric wheel drive—a remarkable development on heavy earthmovers—is the secret behind the world's largest, most powerful scraper. R. G. LeTourneau Inc.'s mammoth earthmover can handle up to 70 tons of earth and rock, equivalent to a payload of 50-60 cu yd. The company says a reported 100 cu yd scraper (ENR Aug. 28, p. 22) is still in the planning stage.

Each wheel in the unique "electric wheel" system has a powerful dc electric motor geared directly to its inner rim. The brake system is non-wearing, since braking occurs simply by reversing the current. Another important feature of the new scraper is "power proportioning," which shifts available horsepower away from any wheel that begins to slip.

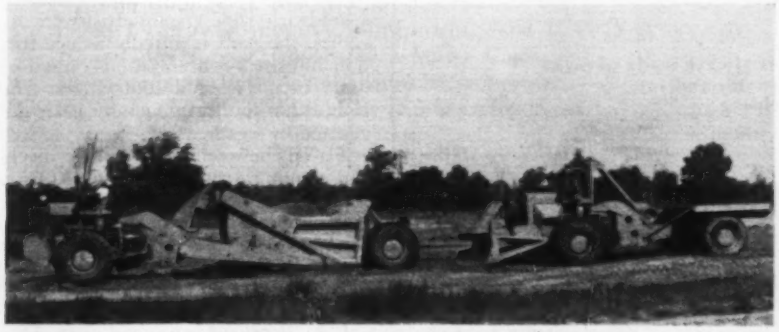
AC motors, spotted where they are needed, provide the power for steering, loading and unloading. All of the electricity for the rig is generated by a 600 hp Cummins diesel coupled to ac and dc generators with a combined output of 700 volts. LeTourneau feels its new electrical system reduces maintenance costs and downtime by eliminating mechanical drive.

The super-scraper is more than twice the capacity of today's average scraper. It cruises at a top speed of 20 mph when fully loaded. It has an empty weight of 65 tons, less than the load it's designed to carry. The earthmover is 62 ft long, 14 ft wide and travels on widebase tubeless tires 7.3 ft tall.

This giant scraper is R. G. LeTourneau's first entry in the earthmoving field after a five year absence. It is considered the forerunner of even larger LeTourneau scrapers ranging up to 130 tons and 100 yd capacities.

The scraper is reported "in the $100,000 class." It will be on display at the American Mining Congress in San Francisco, September 22 to 25. R. G. LeTourneau, Inc., 2399 S. MacArthur, Longview, Tex.

(*New Products continued p. 70*)



DURING LOADING the scraper is pushed by a 600 hp LeTourneau tractor. Behind each over-sized "hub cap" is an electric motor to provide the driving and braking power.

Weldynamics

ARC WELDING AT WORK CUTTING COSTS

Portable power plant saves time and money for builders

How often have you needed electric power on a job before commercial lines were available? Weldynamics bring you low cost, easy-to-use power in the form of Weldanpower.

Weldanpower generates 5KVA of 230 and 115 volt power and 200 amps welding current with one machine. It's the answer to the contractor's power problems. Lightweight, compact, easily trucked from one job to another, Weldanpower packs a lot of punch!

Weldanpower furnishes 5KVA 115/230 volt AC, 60 cycle power and 200 amps AC welding current.

IT'S A WELDER TOO!

As a 200 ampere welder, Weldanpower is always ready to make on-the-spot repairs or work on construction—and you can run lights and equipment while welding.

Get the facts on how you can cut costs with Weldanpower. Write for Bulletin SB-1339.

The World's Largest Manufacturer of Arc Welding Equipment

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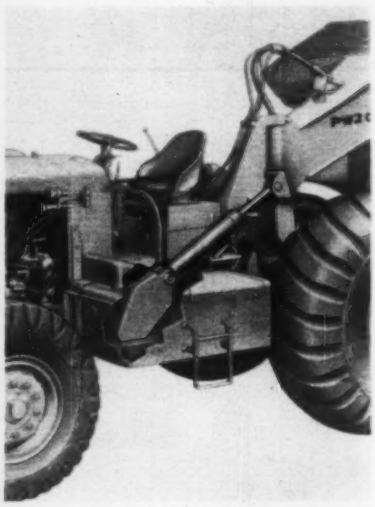

Drive Wheels Aid Pull, Tie to Traction Booster

By transferring weight from the tractor steering axle to drive wheels, an attachment for the Caterpillar DW 20 (Series E) tractor, known as the Athey "Traction Booster," is claimed by the manufacturers, to provide additional traction.

The booster is mounted on the tractor between the hitch and the tractor chassis and hydraulically controlled by the operator with a single lever valve. It is designed especially to give additional tractive effort when working in sand cuts and fills, over soft ground, on wet road surfaces with adverse grades, and whenever extra traction is required. Athey Products Corp., 5631 W. 65th St., Chicago 38, Ill.

Bearing Pad Slides Made For Use as an Insulator

Dense pads of asbestos fiber and synthetic rubber binder are being made for use in bridge construction under the name KON-X.

One application is between concrete beams and bridge abutments. Placed in a sandwich with graphited surfaces together, the pads reportedly reduce friction and stress concentrations caused by beam expansion and contraction. The pads, says the manufacturer, are unaffected by weather.

Placed between steel bridge decks and aluminum guard rail bases, KON-X pads prevent electrolytic action between the dissimilar metals. The ¼ in. thick material weighs about 2.5 lb per sq ft. It is available in sheets 50 x 50 in. and 50 x 75 in. Keasbey & Mattison Co., Ambler, Pa.

(New Products continued page 72)

EXPRESS PAVER resurfacing 15 miles of U. S. Highway 70 south of Huntington, Tennessee. Warren Brothers also used Blaw-Knox Wideners on their portion of the $1,200,000 contract. Express Paver is laying upwards of 1,000 tons per day in a 1½ inch layer. Job Superintendent Bragg is shown at left and General Superintendent Duckworth at right.

"We're 50% ahead of schedule because of the speed of this Blaw-Knox Express Paver"

"Despite the difficulty of this particular mix, our Blaw-Knox unit is laying up to 142½ tons per hour. Although we've had weeks of bad weather, we're 50% ahead of schedule on the maximum 250-day contract time," says R. F. Bragg, Job Superintendent on the Warren Brothers project.

"The quality of roadway is superior to that layed by crawler-mounted equipment. And the Blaw-Knox longer wheelbase reduces waves in the pavement that are sometimes felt when driving over asphalt roads laid by shorter wheelbase pavers. Rubber tires make it possible for us to work faster in completing the major moves that the machine makes, and it paves up to 20% more in the same amount of time," adds Ray Duckworth, General Superintendent.

Here is another instance of proved advantages —faster, better quality paving with freedom of movement—that contractors everywhere are experiencing with the new Blaw-Knox Express Paver. See your nearest Blaw-Knox Distributor for a technical report on this project, or write direct. There's no obligation, of course.

BLAW-KNOX

BLAW-KNOX COMPANY

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TRU-LAY *flexible* PUSH-PULLS

FOR

Remote Control Jobs

on a great variety of

Construction Equipment

Adaptability to all sorts of mechanical situations explains, in large measure, the wide-spread use of TRU-LAY PUSH-PULLS on tractors and their accessories, power shovels, winches, road graders, road oilers, dump trucks, snow plows, engine-driven pumps, rock crushers and other construction equipment.

These dependable Push-Pulls are used for the remote control of hydraulic and air valves, brakes, clutches, transmissions, throttles, chokes, governors, power take-offs, and many other applications.

TRU-LAY PUSH-PULLS are precision products, not gadgets. They provide positive remote-action whether anchorages are fixed or movable . . . for light loads or loads up to 1,000 lbs. . . . and they are effective over short or long distances, up to 150 feet or more.

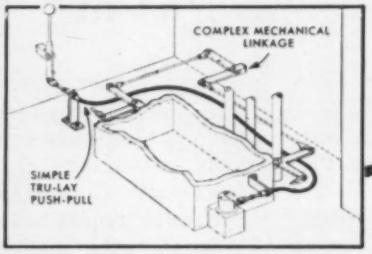
TRU-LAY PUSH-PULLS are dependable and accurate even under the most adverse conditions

They perform effectively under extremes of heat or cold . . . from jet engine temperatures to 70° below zero F. The inner, working member (lubricated for life during assembly) is fully protected by the tough, flexible conduit. Abrasive dusts, dirt and moisture are sealed out. Fittings are cold-swaged to make them integral parts of the control unit. It is a matter of record that we have never heard of a TRU-LAY *flexible* PUSH-PULL wearing out in normal service. Use of these versatile, simple and rugged controls increases ease of operation and means the virtual elimination of maintenance.

Advantages of Tru-Lay Push-Pull flexibility and simplicity are pictured below

Simplicity vs Complexity

Compare the TRU-LAY PUSH-PULL cable in illustration with the mechanical linkage. PUSH-PULLS are simple, have but one moving part, are noiseless and give lifetime service accuracy. Linkages are complex, made of many parts; they wear at many points. Their use brings increased backlash, lost accuracy and vibration rattles.



"Solid as a rod but *flexible* as a wire rope" is a good description of TRU-LAY PUSH-PULL REMOTE CONTROLS. This flexibility makes it possible to snake around obstructions . . . permits the ideal arrangement of all control elements . . . greatly simplifies installation of controls by reducing the number of working parts . . . damps out noise and vibration. Versatile, accurate, adaptable, rugged . . . they are the ideal remote controls for construction equipment.

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Self-Propelled Tamper Packs Earth, Black-Top

A self-propelled, compact power tamper has been developed for packing down earth backfill in trenches and around foundation sites and piers and even for black-top paving and patching.

It's known as the Model 18KT. Shoes 18 in. and 24 in. wide are available. A special heater attachment for the shoe can be furnished to prevent black-top sticking.

The Kelly Power Tamper has a 4-cycle gasoline engine operating at 3 1/2 hp to deliver 2,400 one-ton impacts per minute. It is equipped with shock absorbing handles to dampen vibrations and help prevent operator fatigue. KELLEY MACHINE DIV., WIESMER-RAPP CO., INC., 285 HINMAN AVE., BUFFALO 23, N. Y.

. . . New Products Briefs

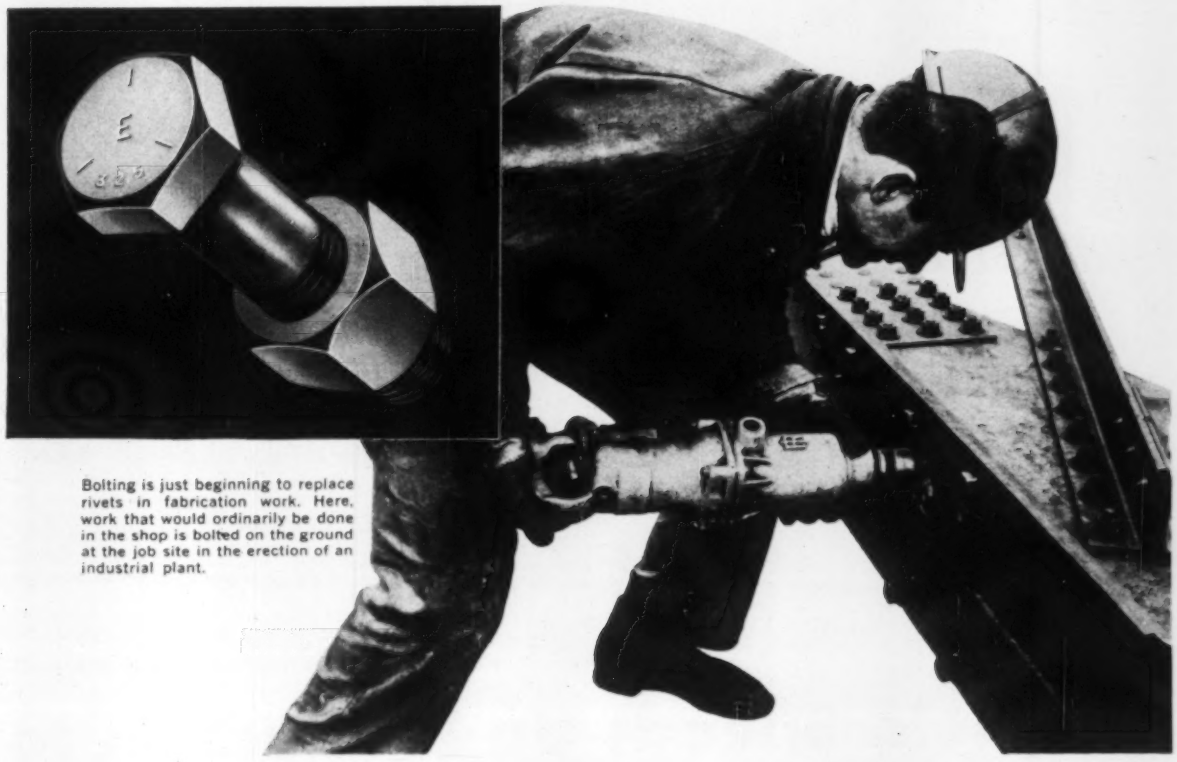
• **Air-powered hoists**—The Master Power No. 105 series hoists are available in capacities of 1,000 and 2,000 lb. The units weigh only 27 lb, come with link or roller chain and can be fitted with either a manual throttle or pendant control. A mechanical safety brake assures positive control of the hoist at all times, the manufacturer says. MASTER PNEUMATIC TOOL CO., INC., KRICK ROAD, BEDFORD, OHIO.

• **Heating line**—A new series 10 Imperial forced-air-furnace line now on the market includes five sizes of downflow models in capacities from 80,000 Btu to 160,000 Btu per hour, and nine sizes of upflow models in capacities from 75,000 Btu to 200,000 Btu. THE PAYNE CO., 855 ANAHEIM-PUENTE ROAD, LA PUENTE, CALIF.

• **Chain saws**—Direct drive Model 7-19 and gear drive Model 7-21 designate two portable gas driven saws offered with seven month manufacturer's guarantees. The 7-19 weighs only 19 lb, and is rated to fell trees up to 5 ft in diameter. The 7-21, weighing 21 lb, will reportedly handle trees up to 7 ft in diameter. Straight blades, plunge cut bows and brushcutter attachments will fit either saw. HOMELITE, PORT CHESTER, N. Y.

• **Crane jib**—A new style jib is available for Link-Belt Speeder's K-300 and K-600 Series cranes. The basic two-piece 20 ft jib has a maximum capacity of 10 tons. The jibs can be extended with 10 ft sections to 30 or 40 ft. LINK-BELT SPEEDER CORP., CEDAR RAPIDS, IOWA.

RB&W High Tensile Bolts . . .



Bolting is just beginning to replace rivets in fabrication work. Here, work that would ordinarily be done in the shop is bolted on the ground at the job site in the erection of an industrial plant.

cut shop assembly costs with field-proved economy

Engineers and architects now know first-hand the two major advantages of high strength bolts: connections are stronger and permanently tight under all types of loads. Steel in-place costs are less.

But are you overlooking advantages of high strength bolts when it comes to sub-assemblies and shop fabricated members?

Of course, simple members with repetitive, close-together holes favor the use of existing riveting machines. With complex and unwieldy members, it's another story. Ironwork can be pulled together and joined with fewer manhours. One fabricator, for example, saved 22% in manhours and 9% on overall costs by bolting 68-ft. long pitched roof trusses that stood 14 ft. high at midpoint.

In any case, just as it does in erection, the high strength bolts will make shop fabricated joints stronger and permanently tight despite vibration and dynamic loads.

Investigate the advantages of specifying a combination of RB&W high strength bolts and rivets for *fabricated* steel . . . and be sure to specify RB&W bolts for *erected* steel. They are easy to install expertly, conform fully to ASTM specification A325, are approved for their consistent high quality.

Send for this Bulletin on high strength bolts. Write Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N.Y.

R B & W

114th year

Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee, New Orleans, Denver. **Distributors** from coast to coast.

FULL SPEED AHEAD

...ON THE NATION'S HIGHWAY PROGRAM

and...

Sheffield Speeds Up Production to Meet Mounting Highway Demands

As history's biggest construction program rolls into high gear, more and more paving trains go into action. New speed records are being set in laying slab with a backbone of steel.

Delivery of Sheffield Welded Wire Fabric is keeping pace with the greatly accelerated demand. And future orders, truckload or trainload, will be just as promptly filled. That's because Sheffield took a long look ahead and started plant expansion even before the national highway program was out of the planning stage.

Whether you're working on the Interstate Highway program or in any other construction, you can be sure of on-schedule delivery of Sheffield steel products. Get in touch with your nearest Sheffield office.

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Men and Jobs

Ben Moreell to Retire As Chairman of J&L

Adm. Ben Moreell will retire September 30 as chairman of the board of Jones & Laughlin Steel Corp., Pittsburgh. Succeeding him will be Avery C. Adams, who will retain his present posts of president and chief executive officer.

Admiral Moreell has been an officer of the steel firm since 1947, serving at various times as president, chief executive officer and chairman of the board. He started his Naval career in 1917 and from 1937 until 1945 he served as chief of the Bureau of Yards and Docks and chief of the civil engineers of the U. S. Navy. In 1945 he became chief of the material division of the office of the Assistant Secretary of the Navy.

Mr. Adams joined Jones & Laughlin as president in 1956. He had been president of Pittsburgh Steel Co.

Engineer Is Replaced As Road Commissioner

Quoting that "the statute provides that the commissioner shall be a practical business man," Gov. J. Lindsay Almond has replaced Virginia State Highway Commissioner Francis A. Davis, an engineer, with Samuel D. May, "a highly successful business man."

Mr. Davis returns to his former job as deputy commissioner and chief engineer of the department. He had been made acting commissioner last December to fill out the unexpired term of retiring Commissioner James A. Anderson. When the question of an acting commissioner signing bonds came into doubt, Mr. Davis was appointed commissioner.

D. B. Fugate, deputy commissioner and chief engineer under Mr. Davis, reverts to assistant chief engineer.

Careers

Business

W. O. Bechman has been appointed assistant to the general manager of the Construction Equipment Division, International Harvester Co., Chicago. **Merrill R. Bennett** has been made manager of engineering of the division.

Bucher & Willis, consulting engineers specializing in bridge, expressway and building design, and urban highway planning for the last two years, has opened new offices in Salina, Kan.

The consulting engineering firm of Frankfurter, Harstad & Associates has

Wherever Concrete Meets Concrete

ROBERT S. OVER

FLEXCELL

REG. U.S. PAT. OFF.

NON-EXTRUDING EXPANSION JOINT FILLER

Does the job best!

New Enterprise Stone & Lime Co., Inc., had the job of building the 980,000,000 gallon Mill Run Reservoir and Dam placed in its capable hands by the city authority of Altoona, Pa.

"We used Flexcell on the spillway and its retaining walls," says Robert S. Over, New Enterprise Chief Engineer.

"Flexcell can take it," Mr. Over writes, "and can't be beat when it comes to easy, low cost installation!

Flexcell fiber board bonds firmly to concrete, compresses without extruding, re-expands to keep joints filled. Uniform asphalt impregnation. Tough, rigid, light in weight. Easy to cut and install. Fabricated to your specifications. Call your Flexcell distributor now.

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THE CELOTEX CORPORATION

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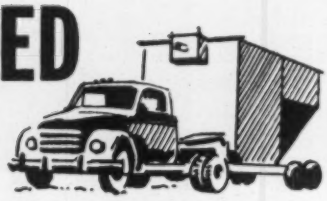
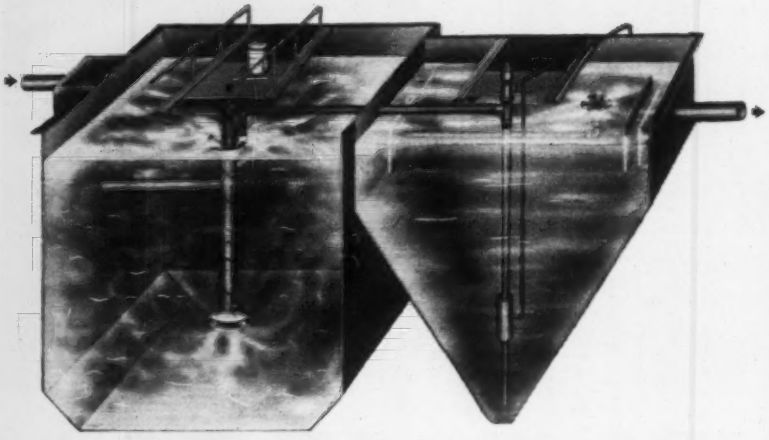
YEOMANS

PREFABRICATED SEWAGE TREATMENT PLANTS





shipped as a complete plant ...ready to place in your excavation!

ECONOMICAL SEWAGE TREATMENT FOR:

Schools
Hospitals
Subdivisions
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Motels
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Restaurants
Trailer Courts
Factories

Make a simple excavation . . . pour a concrete slab. That's all you need do to install this complete treatment plant. And, because these Yeomans plants are standardized, your sewage treatment dollar goes farther. Fast delivery and quick start-up of the plants keep construction schedules flexible, too.

Yeomans "package" plants are built around the well-known Cavitator® which treats sewage by the high-efficiency Aerobic Digestion process. The effluent (discharge) is odorless and clear. There are no blowers, compressors, nozzles, or diffusion tubes to be maintained. Standard systems are supplied in capacities from 2000 to 7500 gallons per day. A factory-trained engineer is available to supervise installation, train operators, and test performance.

Your investment is safe in a Yeomans sewage treatment plant. Each one incorporates 60 years' experience in handling sewage. Each is fully approved by health and building authorities. Why not write for details now.

T-5802

Send for Bulletin No. 101 on Prefabricated Sewage Treatment Plants

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YOUR MOST COMPLETE LINE OF SEWAGE TREATMENT EQUIPMENT

. . . Men and Jobs

opened offices at 2512 Second Ave., Seattle. Principals are **Alroy E. Frankfurter** and **David R. Frankfurter**, formerly chief engineer and assistant chief engineer, respectively, for Sandwell & Co., Inc., and **Howard T. Harstad**, Seattle consulting engineer.

Bennett W. Burns has been made managing partner of H. E. Bovay, Jr., consulting engineers', Houston, Tex., office. **S. J. Bell** will take up Mr. Burns' former duties as chief engineer, Houston.

Public Works

Col. Robert W. Love has become head of the five-state U. S. Army Engineer District, Corps of Engineers, with headquarters in Mobile, Ala. **Col. Harold E. Bisbort**, former District Engineer, has been assigned to duty with the U. S. European Command Headquarters in France.

Col. William W. Smith, Jr., has been named District Engineer, Pittsburgh District, Corps of Engineers. He succeeds **Col. Harold E. Sprague**, assigned to the office of the Chief of Engineers in the Pentagon.

Lt. Col. W. C. Gribble, Jr., has assumed his post as the seventh District Engineer for the U. S. Army Engineer District, Alaska.

Gilbert M. Schuster has become public works director for the city of Tacoma, Wash. He was district paving engineer for the Portland Cement Association.

W. J. Nelson, area engineer for the U. S. Bureau of Public Roads in Sacramento, Calif., retired June 30 after 32 years service with the agency. He has been with the Sacramento office since 1952.

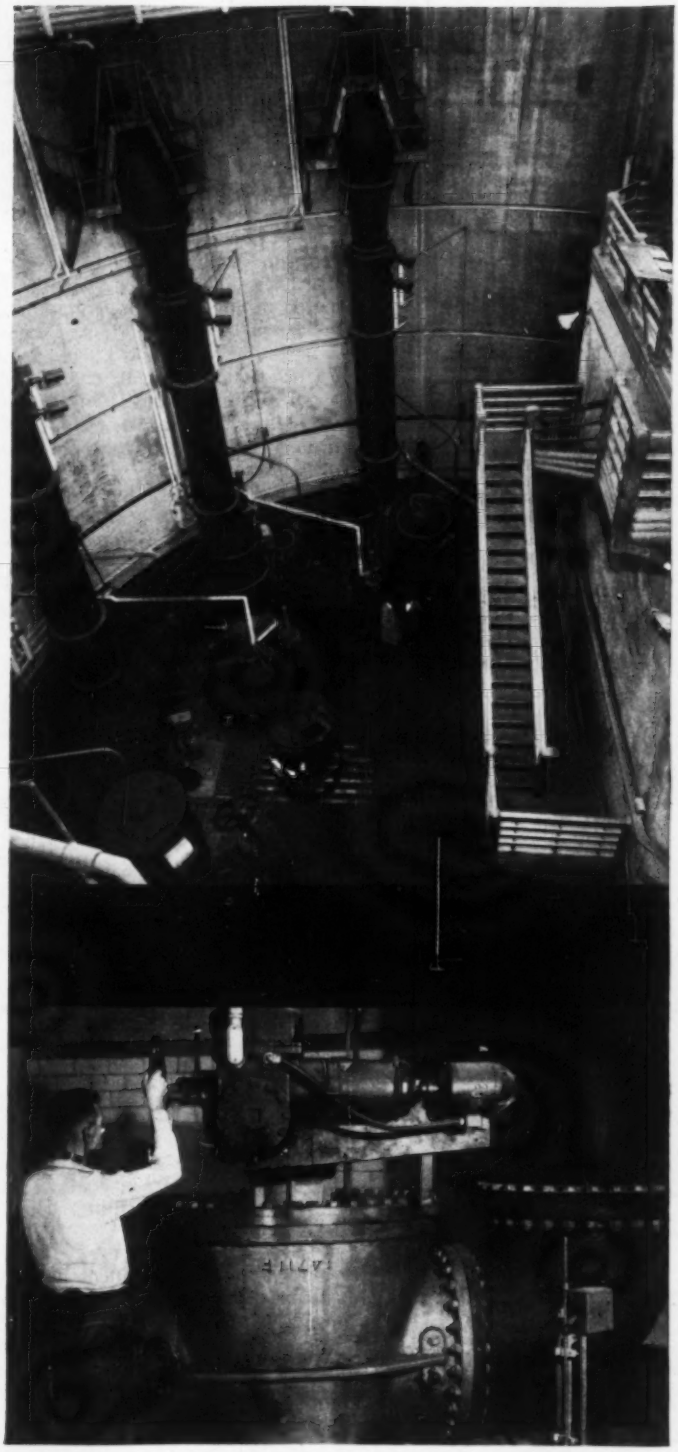
Leslie L. Maxwell has been named engineer in charge of freeways in Delaware, leaving his post of New Castle County division engineer to be filled by **Raymond E. Tomasetti**, who has been with the division since 1948.

Capt. Alexander C. Husband, CEC, USN, has begun duty as district public works officer for the First Naval District, Boston.

Associations

William H. Larkin has assumed the presidency of the National Council of State Boards of Engineering Examiners. He has been a member of the New York State Board of Examiners of Professional Engineers and Land Surveyors since 1949.

F. W. Montanari, staff sanitary engineer of the Ohio River Valley Water Sanitation Commission, has been elected secretary-general of the Inter-American Association of Sanitary Engineering (AIDIS).



SMS-Rotovalves On Sewage Pump Discharge

GIVE ACCURATE THROTTLING

At Philadelphia's Southeast and Central Schuylkill Pumping Stations, twelve SMS-Rotovalves with electric operators are installed at the discharge ends of vertical centrifugal pumps. These 30-inch Rotovalves were chosen for their reliability of operation and ability to throttle pump discharge accurately.

Their full-line opening cuts pressure loss to lower pumping costs. Self-purging, monel-to-monel seats are out of the stream, and less subject to wear. Rotovalves give quick, easy throttling operation. Bronze trunnions eliminate friction as the plug first lifts, then turns, finally reseats in the desired position. For emergency closure, maximum initial shut-off eliminates sufficient line surge shock to prevent damage to pump parts.

You can obtain full information on SMS-Rotovalves, as well as the complete line of Ball Valves and R-S Butterfly Valves, by contacting our nearest representative. Or, write to S. Morgan Smith Company, York, Penna.

◀*Overall view shows dry well and discharge risers. Close-up (lower photo) shows a 30-inch Rotovalve equipped with electric motor-driven operators.*

S. MORGAN SMITH HYDRODYNAMICS

AFFILIATE: S. MORGAN SMITH, CANADA, LIMITED, TORONTO

6

Rotovalves • Ball Valves • R-S Butterfly Valves • Free-Discharge Valves • Liquid Heaters • Pumps • Hydraulic Turbines & Accessories

Rockwood shopping center of Fred Meyer, Inc., Portland, Oregon, is 216'x313'-6" in size, with structural framing of cantilevered glulam girders which provide 44'-9" bays. Heavy timber decking is placed over natural finish glulam purlins spaced at 8'.
Architects: Jensen and Gilham, Portland, Oregon.
Andersen & Westfall, Portland, were general contractors.

JOB DATA: Exterior walls: stone, painted concrete, ceramic tile, asbestos panels, glass. **Interior walls:** gypsum board, glass. **Heating:** gas fired forced air. **Ventilation:** full air conditioning. **Lighting:** Fluorescent fixtures. **Volume:** 1,151,172 cubic feet. **Floor area:** 67,716 square feet. **Cost:** approximately 10% below prevailing costs of similar structures in this area.

modern store design

with structural framing of glulam timbers by Timber Structures, Inc.

No structural material is more adaptable for modern design than glulam timbers which are "factory grown" to virtually any size and shape desired. If the store is to be enlarged later, additional timbers of identical design are readily available.

In thousands of outstanding store buildings throughout the nation glulam timbers serve both structural and decorative functions, adding greatly to impressive appearance when left exposed. This results in worthwhile savings in both construction and maintenance.

When planning your store buildings consider glulam timber framing. It will give you permanence, handsome appearance, adaptability for unusual design, and genuine economy. What else could you want?

Interior view shows wide span bays which provide unhampered display space and facilitate customer traffic.

TIMBER STRUCTURES, INC.
P. O. BOX 3782-C, PORTLAND 8, OREGON

Offices in Ramsey, N. J.; New York City; Boston; Philadelphia; West Hartford; Cleveland; Charlotte; Chicago; Centerline, Mich.; Kansas City; St. Louis; Minneapolis; Des Moines; Wichita; Memphis; Dallas; Houston; Birmingham; Los Angeles; Seattle; Spokane; Denver.

Local Representatives throughout the United States and Canada

TIMBER STRUCTURES, INC. OF CALIFORNIA
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CHARTER MEMBER

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Sweet's

Obituaries

Elmer Clark, 80, former head of the federal Public Works Administration during the Roosevelt Administration. He worked for the Pennsylvania Railroad before and after World War I, serving at one time as the railroad's chief engineer in charge of surveys and construction. During the war, he was a lieutenant colonel in the Transportation Corps of the American Expeditionary Force. Mr. Clark began his PWA career as assistant engineering director. He became administrator in 1940. He later worked for the Bureau of the Budget, from which he retired in 1946.

Ray L. Hamilton, 58, a vice president of Bechtel Corp., San Francisco. He had headed engineering activities of the company's pipeline division since 1951, working on such projects as the 1,100 mile Trans-Arabian pipeline.

J. C. Northcott, 74, of Asheville, N. C., retired bituminous engineer and supervisor with the North Carolina Highway Department.

Stephen K. Jones, 86, president of S. K. Jones Construction Co., Memphis. His firm specialized in highway and Mississippi River levee building. He was an organizer and past president of the Mississippi Valley Flood Control Branch of the Associated General Contractors.

James H. Samford, vice president, A. C. Samford, Inc., construction firm of Albany, Ga.

Frederick C. Hensel, 76, a retired engineer for the City of Syracuse, N. Y.

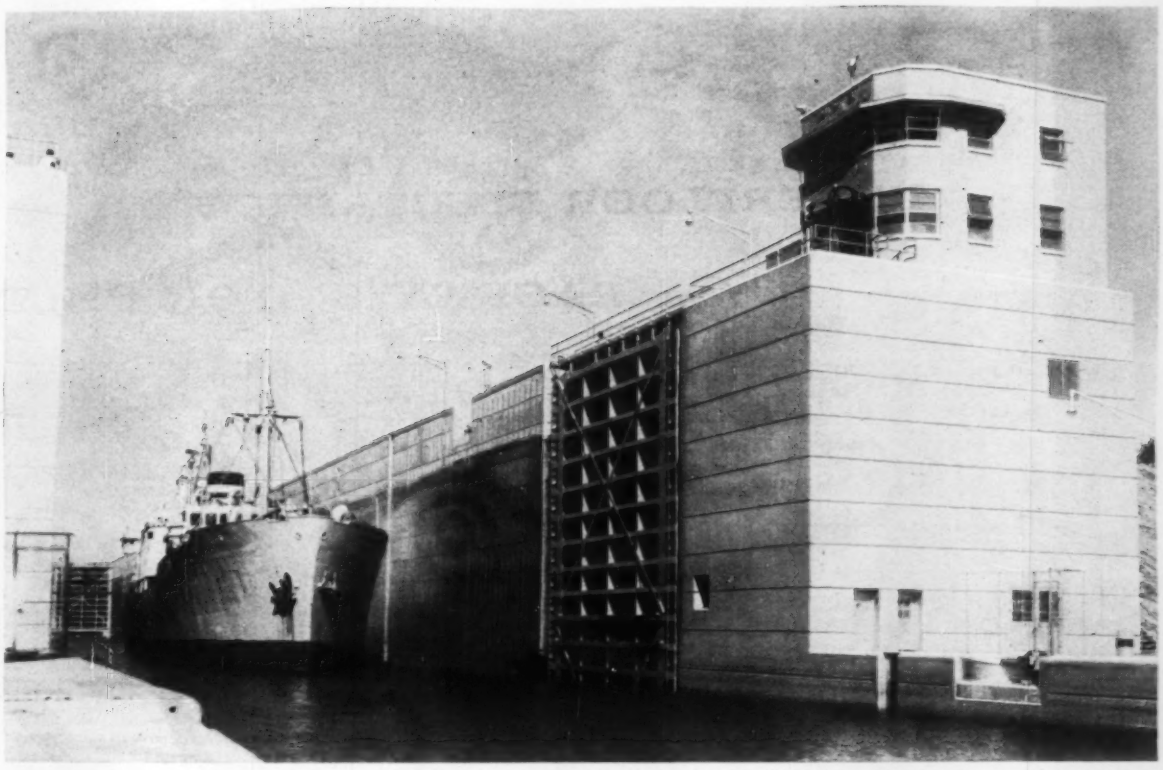
Frederick Wierk, 57, designer of the Quonset hut. He was a graduate of the Stevens Polytechnic Institute, Hoboken, N. J.

Jesse M. Coble, 53, president of Jesse M. Coble Construction Co., Greensboro, N. C. His firm had constructed bridges throughout the southeast and handled highway construction projects in North Carolina.

Ross F. Taylor, 67, civil engineer and Sierra County, Calif., surveyor.

James E. Casale, 68, architect who remodeled some 3,000 houses in New York City.

Forester E. Woodruff, 58, owner of F. E. Woodruff, consulting engineers in Fort Worth.



Dwight D. Eisenhower Lock, 800 ft. long and with concrete walls 100 ft. high, is one of the Seaway projects in which Lehigh Cements were used. Supervising Engrs.: U.S. Army Corps of Engrs. General Contractor: Morrison-Knudsen, Walsh, Perini.

LEHIGH CEMENTS CONTRIBUTE TO ST. LAWRENCE SEAWAY AND POWER PROJECT

Opening the heart of a continent to ocean commerce and providing vast new sources of electrical power, the St. Lawrence Seaway & Power Project takes its place as one of the great engineering and construction feats of our time.

We are proud of the part Lehigh Cements played in this project . . . proud that we are sharing in the building of a better, more productive nation.

- **Lehigh Portland Cement**
- **Lehigh Early Strength Cement**
- **Lehigh Mortar Cement**
- **Lehigh Air-Entraining Cement**

3300 ft. long St. Lawrence Power Dam is world's second largest, producing 2.2 million H.P. of hydroelectric power. Masonry walls of this 10-story powerhouse, at American end of Dam, are laid up with Lehigh Mortar Cement. Consulting Engrs.: Uhl, Hall & Rich. General Contractor, U.S. Half: Perini, Walsh, Morrison-Knudsen, Kiewit, Utah.

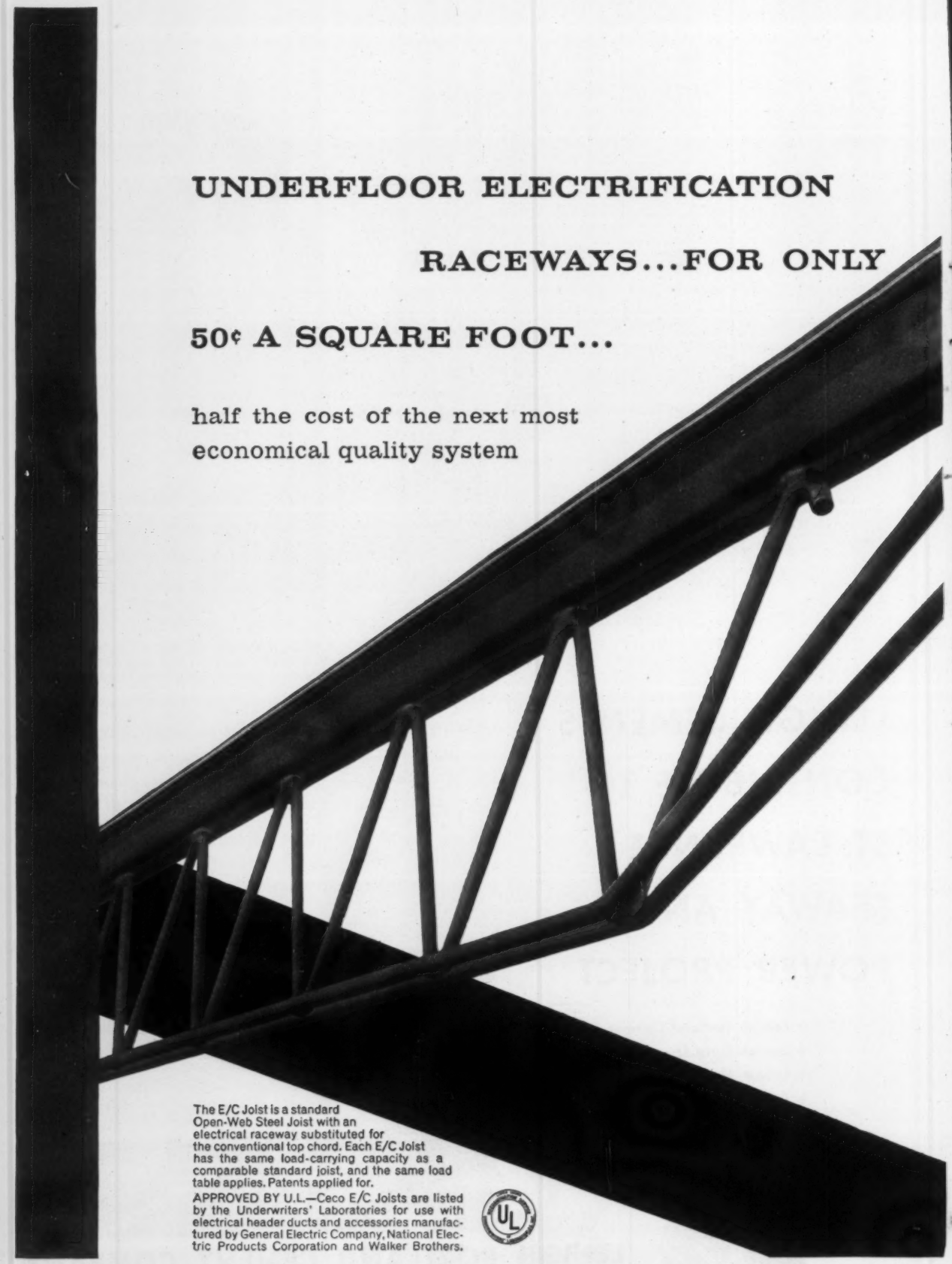
LEHIGH PORTLAND CEMENT COMPANY
Allentown, Pa.

UNDERFLOOR ELECTRIFICATION

RACEWAYS...FOR ONLY

50¢ A SQUARE FOOT...

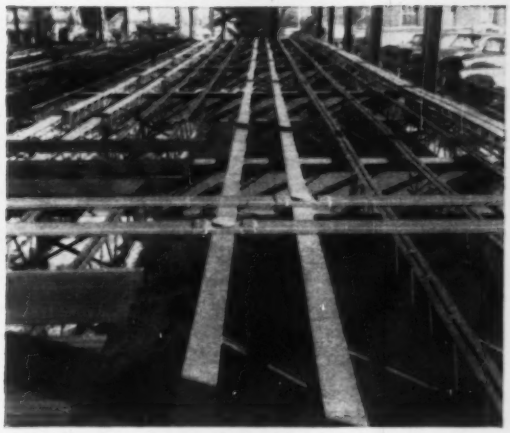
half the cost of the next most
economical quality system



The E/C Joist is a standard Open-Web Steel Joist with an electrical raceway substituted for the conventional top chord. Each E/C Joist has the same load-carrying capacity as a comparable standard joist, and the same load table applies. Patents applied for.

APPROVED BY U.L.—Ceco E/C Joists are listed by the Underwriters' Laboratories for use with electrical header ducts and accessories manufactured by General Electric Company, National Electric Products Corporation and Walker Brothers.

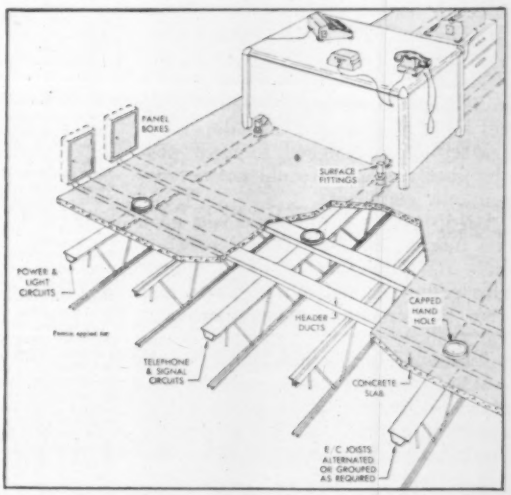
In this case, pairs of E/C Joists are alternated with pairs of standard joists at 18" o.c., and tie in with a two-duct system at 6'-0" o.c. The header ducts here were installed during a 4" snowfall, demonstrating that construction can proceed in bad weather.



E/C Joists can be substituted directly for standard joists to provide as many electrical raceways as desired. The two header ducts, shown horizontally in the foreground, feed wires into the E/C Joists through the hand-holes in the center of the photograph.

You save with Ceco Electro-Channel Steel Joists because they serve a double purpose...

A new product that reduces costs and increases utility makes welcome news. Such a product is the Ceco Electro-Channel Steel Joist, which provides raceway systems for top-quality underfloor electrification for as little as 50¢ a square foot. This is half the cost of the next most economical quality system. The saving is possible because E/C Joists do two jobs . . . carry the electrical as well as the structural loads. Included with the Ceco system are header ducts, hand-holes and markers, installed—as well as the E/C Joist integral raceways. The 50¢ buys a two-duct system on 6'-0" centers, and represents the cost over and above standard steel joist floor framing. Comparable savings are offered in three-duct arrangements. Call your Ceco engineer or send coupon for manual. Ceco Steel Products Corporation—Sales offices, warehouses and fabricating plants in principal cities. General offices: 5601 West 26th Street, Chicago 50, Illinois.



Electrical, telephone and signal wires can be run from the panel boxes down through the heater ducts, into the top chord of the E/C Joist and up through the surface fittings to desks located anywhere on the floor. Whenever desks are moved, surface fittings can be placed along the joists to service the new positions.

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IN CONSTRUCTION PRODUCTS CECO ENGINEERING MAKES THE BIG DIFFERENCE

Steel Joists / Steelforms / Concrete Reinforcing
Curtainwalls, Windows, Screens, Doors / Cecoframe
Buildings / Roofing Products / Metal Lath

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Please send Introductory Manual No. 3011 covering Ceco Electro-Channel Steel Joist Construction.

name_____ position_____

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Controversial cut and cover conduits in . . .

$30 Million Niagara Power Contract

Concrete work accounts for half and excavation for 27% of this $29,861,840 contract for Work Section 3 of the waterways in Niagara County, N. Y., part of the Niagara Power Project for the Power Authority of the State of New York.

The second contract of three for work on the water conveying conduits, this award went to Gull Contracting Co., Inc., Flushing, N. Y., bidding jointly with L. G. DeFelice & Sons, Inc., North Haven, Conn., on a bid less than 2% below the second of the six bids.

Uhl, Hall & Rich, Boston, is consultant.

Controversy over cut and cover vs open conduits held up these awards for several months. The Federal Power Commission, as a condition for granting a license for the $600 million Niagara Power Project, insisted on cut and cover for reasons of safety, community planning and civil defense (ENR Feb. 6, p. 26).

The twin conduits, 46 ft wide and 66 ft high, stretching 4½ miles each, will be of three-hinged arch design. A rigid structure designed to resist possible rock movement could not be economically employed.

Lead sheet, ⅛ in. thick, will be used as a lubricating base and seal between walls and base slab of the conduits. This permits lateral movement to preserve the structure, while affording a seal against water leakage and necessary load-bearing qualities.

Wages on the job include: trench excavators, tractor operators, shovel and crane operators, $3.775; carpenters, $3.575; concrete finishers, $3.75; common laborers, $2.80.

The six bids included:

1C Gull Contr Co. & L.G. DeFelice & Son, Inc	$29,861,840
2 Edw. Balf Co., Savin Bros., Inc., and D.W. Winkelman Co., Inc	30,353,460
6 Channel Constructors, a joint venture of Peter Kiewit Sons Co., Morrison-Knudsen Co., Inc., Walsh Constr. Co., and Perini Corp	35,799,990

Bids: 5-20-58 Items	Unit	Quantity	Unit Prices 1C	2
Reloc of Witmer Road	ls	job	$400,000	$550,000
Excavation, unclassified				
water conduits	cy	4,170,000	1.75	1.80
conduit unwaterg pump sta	cy	8,400	20.00	30.00
power canal	cy	389,000	1.75	1.70
bri abuts & footings	cy	4,800	3.00	3.00
proposed reloc portion of Rome, Watertown & Ogden Branch, NY Central RR	cy	20,000	0.30	0.60
misc structures	cy	2,000	2.50	6.00
Drill & grout holes in overburden	lf	500	5.50	5.00
Core drill NX holes in stage				
bet 0-50' deep	lf	500	5.00	9.00
50' & over	lf	300	5.50	15.00
Drill grt holes bet depths				
0-50'	lf	3,000	3.50	6.00
50' & over	lf	2,000	3.50	8.00
Met pipe & ftgs for fndn grouting f&p	lb	5,000	0.50	1.00
Pressure grt, guar amt	cy	2,000	4.00	5.00
non-guar amt	cy	5,000	2.00	3.00
Hookups to grout holes	ea	50	10.00	20.00
Sand for sand cmt grt mix	cy	500	1.00	1.00
Drill holes for anchor bars & groutg bars in place	lf	483,200	0.80	1.50
Split pipe drains, 8"	lf	97,000	2.00	1.50
12"	lf	14,200	2.50	2.50
24"	lf	22,600	6.00	7.00
Asbestos cmt pipe drains	lf	24,900	1.25	1.50
Backfill, water conduits	cy	2,250,000	0.90	1.35
Topsoil, canal banks	sy	5,000	0.20	1.00
Rockfill, agg raw matl, stockpile #5	t	675,000	0.30	0.20
Overburden stpl, reservoir	t	282,000	0.50	0.20
Rock fill, reservoir spoil	t	4,990,000	0.42	0.20
Fill, reloc NY Central RR	cy	31,000	0.50	0.50
Haul road, 80' wide c&m	lf	5,700	130.00	75.00
remov	lf	3,000	9.00	5.00
40' wide c&m	lf	3,000	20.00	45.00
remov	lf	3,000	3.00	3.00
Portland cement	bbl	440,000	4.85	5.14
Natural cement	bbl	60,000	4.85	5.65
Reinforcement bars	lb	45,000,000	0.11	0.11
Conc in water conduit				
floors & walls	cy	230,000	15.00	12.80
arch roofs	cy	151,000	15.00	12.80
unwaterg pump sta & pump sta tunn linings	cy	2,800	30.00	40.00
outlet stop log structs	cy	17,900	25.00	30.00
outlet transition struct	cy	27,500	15.00	30.00
footgs, piers & bri abuts	cy	610	45.00	35.00
hwy bri over Witmer Rd	cy	1,800	48.00	55.00
misc structures	cy	1,000	60.00	80.00
blockouts	cy	370	70.00	160.00
for use in Sect 4 contr	cy	15,500	2.50	3.00
Precast conc slabs	sf	350	3.00	20.00
Flat paint at contrac jts	sf	259,000	0.19	0.10
Rubber water stops	lf	93,600	1.25	2.00
Plastic foam joint filler	bf	223,500	0.29	0.20
Sheet lead joint filler	sf	64,000	0.95	1.20
Concrete joint sealer	cf	750	17.50	30.00
Rubber sealing compound	cf	2,200	150.00	160.00
Coal tar coating, arch hinge joints	sf	124,300	0.25	0.70
Dampproofing	sf	5,400	0.10	0.20
Structural bridge	lb	90,000	0.03	0.10
Track rails & access	lb	4,000	0.10	0.20
Struct stl batch cover	lb	160,000	0.05	0.15
Misc metal work	lb	25,000	0.50	0.80
Galv misc metal work	lb	5,000	0.75	1.00
Alum ornamental work	lb	4,000	1.00	0.70
Conduit outlet stop log guides	lb	380,000	0.13	0.20
Stoplogs	lb	900,000	0.05	0.07
Unwatering pumps	ls	job	10,000	12,000
piping f&i	lb	66,000	0.50	0.80
2 gates & lifts	ls	job	5,000	20,000
Unit substation in conduit unwaterg sta B	lb	30,000	0.10	0.10
Misc transformers	lb	600	0.50	0.45
Insul wire & cable, size A	lb	1,000	2.00	3.00
B	lb	5,000	1.00	1.10
C	lb	1,000	0.50	0.70
Elec conduit, metal, size A	lb	2,000	2.50	3.00
B	lb	2,500	1.40	2.00
B	lb	1,000	1.10	1.50
non-metal, all sizes	lf	3,000	2.00	2.50
Ltg syst, conduit unwaterg sta B	ls	job	1,200	1,500
Grounding system	lb	1,000	2.00	2.50
c&m construct & maintain f&p furnish & place		f install		

Commence: 5-30-58. Completion shedule: 1,096 cal days.

The following table compares unit prices on selected items quoted by the low bidders on Niagara Power Project construction Work Sections 1, 2 and 3 of the waterways in Niagara County, N. Y. All of these contracts cover work on the water conduits. Section 1 includes cofferdams and river intake. The low bidders on these contracts were:

Sect. 1 Merritt-Chapman & Scott Corp., N.Y.C.
2 The Edw. Balf Co., Savin Bros., Inc., and D. W. Winkleman Co., Inc.,
3 Gull Contr. Co. and L.G DeFelice & Son, Inc.

Section No.		1	2	3
Bids:		6-6-58	6-3-58	5-20-58
Items	Unit	Unit Prices		
Exc, uncl, misc structs	cy	$6.00	$5.00	$2.50
bri abuts & footings	cy	22.00a	.....	3.00
water conduits	cy	1.40	1.90	1.75
Bkfl, water conduits	cy	0.90	1.00	0.90
Conc work in water conduit				
floors, walls & arch roofs	cy	16.00	12.50	15.00
blockouts	cy	150.00	.....	70.00
unwaterg pump sta & pump sta tunn lining	cy	56.00	.....	30.00
footgs, piers & bri abuts	cy	50.00	.....	45.00
misc structs	cy	110.00	80.00	60.00
Precast conc slabs	sf	2.50	.....	3.00
Drill & grt holes in overburden	lf	3.50	.....	5.50
grt holes, any depth	lf	2.50	.....	3.50
Core drill NX holes, 0-50'	lf	6.00	.....	5.00
any depth over 50'	lf	6.00	.....	5.50
Met pipe & ftgs for fndn grtg f&p	lb	0.75	.....	0.50
Hookups to grout holes	ea	17.00	.....	10.00
Portland cement	bbl	5.15	5.04	4.85
Natural cement	bbl	5.80	5.64	4.85
Reinf bars	lb	0.115	0.115	0.11
Elec conduits, metallic,				
Size A	lb	2.60	.....	2.50
B	lb	1.50	.....	1.40
C	lb	1.25	.....	1.10
non-metallic, all sizes	lb	2.20	.....	2.00
Misc metal work	lb	0.80	.....	0.50
galv	lb	0.90	.....	0.75
Sheet lead joint filler	sf	1.75	1.50	0.95

a Culvert and bridge abutments and footings

Structural Steel Accounts For 91% of Bridge Cost

Structural steel, 7,844,500 lb at 22.3¢, accounts for almost 91% of this $1,929,218 contract for the superstructure of the Chicago, Milwaukee, St. Paul and Pacific Railroad bridge over the Missouri River near Mobridge, S. D. The award by the Corps of Engineers, Omaha, 20.4% below the engineer's estimate, went to J. F. Beasley Construction Co., Dallas, Tex. Sverdrup & Parcel, Inc., St. Louis, is the consultant.

Part of the Oahe Reservoir Project, Pierre, S. D., the bridge will be 1,533 ft long and the approaches 1,164 ft.

The contractor furnishes all materials except 2,349 ft running rail and inner guard rail for the permanent bridge, and 400 ft for the temporary trestle, a total of 2,749 lin ft of single track.

1C J. F. Beasley Constr. Co., Dallas, Tex	$1,929,218
2 Allied Structural Steel Cos., Chicago, Ill	2,055,000
7 Pittsburgh-Des Moines Steel Co., Des Moines Iowa	2,522,963
EE Corps of Engineers, Omaha, Neb	2,424,960

Bids: 6-5-58 Items	Unit	Quantity	Unit Prices 1C	2
Steel, fab struct	lb	7,844,500	$0.223	$0.238
cast	lb	142,900	0.390	0.40
Timber, treated	Mfbm	245.3	282.75	260.00
untreated	Mfbm	123.1	166.50	195.00
Hardware	lb	42,200	0.345	0.50
Track, 2,749 lf lay	ls	job	13,750	14,967
Navigation lights	ls	job	6,000	7,000

Completion schedule: 510 cal days

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES

- Cement, Aggregate Ready-mixed Concrete, Asphalt: Last, Sep. 4: Next, Oct. 9
- Iron and Steel Products, pipe: Last, Sep. 11: Next, Oct. 16
- Wood Products, Glass, Explosives, Chemicals: Last, Sep. 18: Next, Oct. 23
- Wage Rates, Building Board, Lath, Insulation: Last, Aug. 28: Next, Oct. 2

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION—SCORED Per M. lots of 2,000 pieces or over,			STRUCTURAL CLAY TILE—LOAD BEARING—SCORED Per M. lots of 2,000 pieces or over,			BRICK Per M. in quantity		LIME Per ton, in paper, Carload lot,		
	3x12x12 in.	4x12x12 in.	8x12x12 in.	8x12x12 in.	10x12x12 in.	12x12x12 in.	Common backing	Straight hard	Hydrated finishing	Common hydrated	Pulverized or lump
Atlanta	$140.90n	$149.90n	$299.80p	$334.55p	.....	.....	$30.50p	$32.70p	$23.50	$24.50	$.....
Baltimore	217.00	231.00	434.00	491.00	602.00	690.00	36.00k	41.00k	35.60	23.20	.....
Birmingham	135.00p	152.00p	.....	303.00p	376.00p	465.00p	27.00ff	38.00y	35.02	22.30	26.33g
Boston	232.00t	248.00†	463.25†	556.00†	.....	.....	41.50p	46.50p	39.20†	31.20†	.....
Chicago	135.00	145.00	280.00	.....	.....	.....	30.00	32.00	38.00	35.30e	.....
Cincinnati	205.00j	225.00j	296.00ddd	213.00j	288.00j	314.00j	48.75r	47.00r	30.04j	26.04j	30.04j
Cleveland	209.00	223.00	.....	475.00	.....	.....	38.00	41.00gg	31.00	25.00	.....
Dallas	152.00	152.00	300.00	364.50	446.25	552.50	7.50	49.00	41.80	24.58	28.50
Denver	.....	.....	.....	.....	.....	.....	21.50	49.50	46.00p	42.00p	46.00p
Detroit	273.00	298.00	545.00	.....	794.00	906.00	47.50p	48.00p	38.00	34.00	.....
Kansas City	158.00	158.00	312.00	312.00	400.00	500.00	33.00	33.00	36.26	34.26	29.76
Los Angeles	r	r	r	r	r	r	32.50ll	.....	38.00	38.00	39.00
Minneapolis	192.00n	215.00n	437.00n	215.00mm	.....	.....	45.60ee	54.00y	47.00bbe	37.00bbe	49.00bbde
Montreal	170.00m	178.00m	325.00ma	270.00r	400.00g	.....	48.25b	56.30b	39.00	22.00	13.25
New Orleans	186.00	186.00	380.00r	380.00	.....	.....	42.00	55.00	44.00	32.00	32.00P
New York	176.90h	188.70h	243.00kk	285.50hh	.....	.....	44.00	.....	40.00	37.00	.....
Philadelphia	169.00	180.20	337.90	405.00	.....	.....	30/34	38/42	27.60	25.60	3.17m
Pittsburgh	147.50r	157.75r	295.00r	335.00r	435.00r	500.00r	39.00r	46.00r	36.00r	31.00r	.....
St. Louis	178.50r	185.00p	391.00p	401.00p	459.00	621.50	43.00f	41.00	0.95aa	80aa	1.35s
San Francisco	156.58*	177.10*	235.30ddf*	.....	.....	.....	43.00*	43.00*	29.24	29.24	31.74
Seattle	235.00n	270.00n	490.00p	285.00pw	.....	.....	48.00	62.00	52.00bb	38.00bb	4.50mbb
Toronto	158.00	173.50	336.00	283.00f	378.00	.....	35.00	63.00	36.00	33.50	31.50

*† F.o.b. Yard. *** F.o.b. plant Stockton. *†† F.o.b. yard Roxbury. *s Smooth. *t $4.50 del. *u 8 x 12 x 12 in.-6 cell. *d Pulverized hot. *v 80%, 10th following month. *f 8 x 8 x 12. *z Lumps, $26.72. *b F.o.b. trucks, job site N.Y.C. *i 60 lb sacks. *j Truck load or over. *k $1.00 discount. *l Red face. *m Per bbl., 180 lb. processed. *n 7¾ x 7¾ x 12. *o Mason's double hydrated pressure. *p Truck lots. *q Provincial and Municipal tax extra. *- Not used: earthquake danger. *s 8 x 16 x 12. *x 2% cash. *u Incl. Federal tax. *v Sand lime. *w 5 x 8 x 12. *y Chi common. *- Pebble: 80 lb sack. *aa 50 lb sack. *bb LCL. *dd 8 x 12 x 12. *ff 80% common. *gg Smooth. $51.50 Rough.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry c	WHITE LEAD Per 100 lb. in 100 lb. cases In oil w	READY-MIXED PAINT Per gal., drums Graphite b	Aluminum c	Ferric Oxide d	ROOFING SUPPLIES: Carload lots f.o.b. factory Rolls, slate surfaced, 85-90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 380 lb. bbl. per ton
Atlanta	$14.25	$30.125	$3.59	$3.86	$3.31	$3.39	$2.20	$2.62	$0.67	$57.75
Baltimore	14.00	29.75	3.00	4.40	3.80	2.78	4.25	4.25	.48	54.25
Birmingham	14.25	30.125	3.90	3.40	....	3.09	2.20ii	2.20ii	.32ff	45.00ee
Boston	14.00	29.75	....	....	....	3.30g	2.23r	2.23r	.50g	58.00g
Chicago	14.00	29.75	....	....	....	4.05nn	3.02ss	3.32te	48.00bbo	57.75t
Cincinnati	14.00	29.75	....	....	....	3.13	2.70	2.73	.428v	55.98
Cleveland	14.00	29.75	2.51rrr	2.60gg	2.92xg	3.51	2.44s	2.85	.58v	49.00gy
Dallas	14.25	30.50	....	2.25R	....	3.00	3.00s	3.00s	.470	66.00kk
Denver	14.50	30.25	3.98	3.20	3.70	2.96	2.16o	2.55s	.48ff	50.00
Detroit	14.00	29.75	2.70	3.95	2.70	2.83	1.91f	2.49f	.432ff	51.00
Kansas City	14.00	30.50	3.99	3.43	3.01	3.02ii	2.14s	2.14s	.63y	....
Los Angeles	14.00	30.00	3.30n	4.50n	4.20n	3.20n	2.15mii	f	.70mv	f
Minneapolis	14.00	29.80/29.75	....	....	....	3.09	2.52ki	2.42ki	.442i	50.00r
Montreal	....	24.05	5.02Dfft	5.94zfft	4.65kfft	5.40	4.65f	4.65f	1.60	....
New Orleans	....	....	....	....	....	2.34	1.63	2.85	0.680	....
New York	13.00C	29.75	....	....	....	3.20	2.16o	2.45o	.425a	49.00*
Philadelphia	14.00	29.75	3.60	3.40/3.85	3.50/4.60	3.00/3.30	2.54o	2.54o	.37/.45	48/54
Pittsburgh	14.00	29.75	2.20kF	2.25kF	2.25kG	3.37a	2.59a	.45	....	....
St. Louis	14.00	29.75	....	....	....	3.27iis	2.39kk	2.85kk	.28y	62.00
San Francisco	14.00	30.00	2.20	4.30	3.58	2.95	1.97aa	3.10	.460jj	54.00
Seattle	14.00	30.25	3.47	4.19ee	....	3.82qee	3.30kee	....	.55ee	51.40aa
Toronto	.....	.....	5.00	5.75	5.80	4.50	3.45e	2.65e	1.10j	50.00A

*† Delivered. * Note: Red lead in oil 80% higher than white lead in oil. ** Aver. wt. approx. 425 to 550 lb drums. *s Red lead prices change frequently due to pig lead price changes. *b U.S. War Dept. Spec. 3-49A. *c ASTM Spec. D266-31. *d 80% minimum ferric oxide. *e 15 lbs. *f Per 432 sq ft. *g F.o.b. yard, Roxbury. *h Per roll, 65 lb. *i Net carload prices, Minneapolis and vicinity. *j 45 gal containers. *k Over 80% ferric oxide. *l Not used. *n F.o.b. city. *o Per 60 lb roll. *p 6-drum, 50 gal each. *q Per 90-lb roll. *r F.o.b. factory, Chicago. *s Truckload. *t Incl. Federal tax. *u Per 90-lb square. *v Per ton. *w Price to contractors $1.25 less. *x Ready-mixed. *y 55-gal container. *z Drums. *aa 15 lb. sq ft. roll. *bb Roofers coating and cement. *cc LCL, truck delivery. *ee Asphalt pitch in 100 lb package. *ff 5-gal drums. *gg F.o.b. factory. *hh Incl. freight. *ii Per roll. *jj Asbestos roof coating. *A 400 lb barrels. *B ASTM Spec. D982-49. *C 99%. *D Std. black. *f Milit. spec.: E TTP27; F TTV81; G TTP31. *H No quoted after Oct. 1957. *R revised.

PLASTER, VERMICULITE AND METAL BUILDING SHEETS & TUBING

	PLASTER‡		VERMICULITE‡			PERLITE‡		ALUMINUM SHEETh†		STAINLESS STEEL† SHEET-TYPE 302g		COPPER WATER* TUBING-TYPE L 2000 ft lots per ft	
	Neat per ton	Gauging per ton	Home Insulation pellets	Plaster aggregate	Concrete Aggregate Untreated per bag of 4 cu ft	Plaster Aggregate	Concrete Aggregate Untreated	Flat .102" th 36"x96" & 48"x144" per lb/t	Corr roof .032" th 35"x12' per shu	20 ga 48"x96-120" per cwthh	28 ga 36"x120" per cwtmm	½"b	¾"e
Atlanta	$31.00	$36.00	$1.55s	$1.65s	$1.80sl	$1.65	$1.65	$0.424n	$9.45n	$61.44n	$67.50	$18.74f	$23.41f
Baltimore	23.80	34.60	0.95	1.15	1.15	1.15	1.65	0.431	0.489r	56.25	64.25	0.1674	0.2371
Birmingham	33.00	39.00	1.55	1.55	1.80l	1.55	1.55l	0.458d	10.48	67.34	76.09	0.1620	0.2261
Boston	22.00	30.00	1.40	1.40	1.45	1.45	1.50	0.462	29.35n	65.42dd	71.92ddff	0.1620	0.2261
Chicago	26.80	26.80	1.55	1.60	1.60l	1.60	1.60	0.506r	10.29ta	65.15aee	73.90aee	0.1620	0.2261
Cincinnati	28.00*	28.00*	1.75	1.75	1.75	1.85	1.90	0.434	9.56	65.28	74.03ff	0.1608	0.2244
Cleveland	28.00	44.70	1.13k	1.16ii	1.24l	1.45	1.45	0.458aa	8.28	65.33ee	74.08oo	16.20f	22.61f
Dallas	30.65	32.65	1.05	1.21	1.32	1.21	1.32	0.484	0.517r	65.00	78.00	0.1520	0.2170
Denver	25.00	25.00	1.50	1.40	1.50	1.40	1.55	0.448	9.75	67.32gg	76.09gg	0.1772	24.69
Detroit	26.00	25.00	1.28	1.33	1.41	1.25k	1.43k	0.456a	10.376a	65.15a	73.90a	22.00f	26.75f
Kansas City	30.00	35.00	1.14	1.18	1.26l	1.18	....	0.444	9.50	67.50	76.25	15.85f	22.09f
Los Angeles	27.00	28.00	1.25k	1.20k	1.25	1.06	1.10	0.486	10.543d	67.10	75.85	0.1620	0.2261
Minneapolis	35.00	35.00	1.55	1.70	1.80	1.40	1.40	0.483	15.15e	65.71	72.21ff	0.1620f	0.2261f
Montreal	27.60A	35.60A	1.25	1.40	1.50	1.15e	1.15e	0.4395	12.10	64.75	....	0.1927	0.2160
New Orleans	34.00	48.00	1.25	1.25	1.25	1.25	1.25	0.424	8.503	71.50	72.45	0.1585	0.2209
New York	25.25	31.25	1.35	1.30	1.80	1.40	1.40	0.493ad	9.29q	68.58	77.33	16.08f	22.44f
Philadelphia	23/25	32.00	1.35	1.35	1.40l	1.0fgg	1.0fgg	0.44qe	9.46a	66/68a	75/77a	15.62f	21.78f
Pittsburgh	30.00nn	33.00nn	1.60nn	1.50nn	1.35	1.73	1.73	0.452	9.46	64.00	76.25ppR	0.1419	0.1980
St. Louis	29.00	40.00	1.35	1.60ff	1.55	1.60	1.60	0.452	10.11	68.11	74.61y	16.20fm	22.61fm
San Francisco	29.50	30.50	1.38	1.38	1.50	1.38q	1.58q	0.502	9.05	67.10	73.60	0.1621	0.2261
Seattle	42.40	45.60	1.55	1.25k	1.85l	1.50k	....	0.486	9.90	67.02	75.77	0.1620	0.2261
Toronto	28.00	45.50	1.20	1.30	1.35l	....	1.55	0.2995	24.00ae	73.74	86.52	0.2525	0.2684p

‡trucklots, delivered †fob warehouse *fob city *adelivered *b¼" O.D. *c⅝" O.D. *d0.100"th *e34" x 60" sheet *fper 100 ft *g5 tons & up; cold roll, anneal & pickled 2B finish *h incl. Federal tax *i add 25¢ for pint of additive *j 1100 & 3003 alloy, mill finish *k bag of 3 cu ft *l treated with air entraining agent *m 2-10M ft *n fob mill fr equalized with nearest stocking competitor *o 250 sacks or more *p 100 sq ft *r per lb. *s 30 lb bag *t 36" x 96:-10.81 lb/sh; 48" x 144": 21.7 lb/sh *u 19.31 lb/sh *v fob plant *w 48" x 144" *x 100th *y 27 gauge *aa 16M lb & up *dd add $1.00 cwt boxing *ee 4 tons & up *ff 26 ga *gg add $2/cwt boxing; $0.75/cwt on skids *hh Theoretical wt for 48" x 96"; 60.4-lb, per sh *ii 300-bag lots *jj 100-lb bag *mm Theoretical wt; 19.7-lb per sh *nn 2% cash *oo skid packed *pp type 304 *qq Philadelphia and suburbs.

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, Reports
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS—BA

▲ **Conn., West Hartford**—SCHOOL—BA 10/2—Town, School Bldg. Comm., Town Hall, Bridlepath Elementary School, Bridlepath Rd. $1,000,000. Plans deposit $60. Willard Wilkins, 945 Asylum Ave., Hartford, archt. Petersen & Hoffman, 607 Main St., Hartford, engrs. CD 9/5/57.

Conn., Bridgeport—SCIENCE, etc.—BA 10/7—University of Bridgeport, Park Place, 2 story, 45,000 sq. ft. science bldg., chemistry, physics and biology laboratory, lecture hall, $900,000. CD 2/26.

HEAVY CONSTRUCTION—LB & CA

▲ **MAINE**—State Hy. Comn., State Office Bldg., Augusta, Me.—**The Bridge Constr. Corp.**, Augusta, Me., CA $619,703 (6 bidders), grading, drainage and base 2.497 mi. FAP No. I-95-6(10)118, Waterville;

Me.—**C. W. Qualey**, Gray, Me., CA $130,710 (4 bidders), bit. grav. road and bridge 0.663 mi. FASP No. S-0180(2) Byron;

Me.—**Farrin Bros. & Smith**, Brighton, Me., CA $431,518 (5 bidders), b. conc. road 2.708 mi. FAP Nos. DF-037-1(9) and F-037-1(7), Dexter. Bids Sept. 3. Grand total $1,181,931.

▲ **Salah & Pecci Constr. Co., Inc.**, 233 Harvard St., Brookline, Mass., LB $1,312,415, Contr. No. 1103, beach imprvs. Phase 2-sea wall bastions and boat gates, Wollaston Beach, Quincy, MASSACHUSETTS. Commonwealth of Mass., Metropolitan Dist. Comn. Parks, Dpt., 20 Somerset St., Boston, Mass. Bids Sept. 10. CD 1/30.

▲ **CONNECTICUT**—State Hy. Dpt., 165 Capitol Ave., Hartford,

White Oak Excavator, Inc., 61 East Main St., Plainville, Conn., CA $4,782,130, Proj. 42-105, East Hartford Expressway High to Pitkin Sts., 2 mi. elevated hy., 4 lane high street access to Willow and Main Sts., 6 lane northerly, Hartford Co., bids Aug. 28. CD 7/30, under LB.

BUILDINGS—LB & CA

▲ **Grande & Son, Inc.**, 175 Maplewood St., Malden, Mass., CA $2,826,286, est. $2,700,000, REGIONAL HIGH SCHOOL, Rte. 2-Walden St., CONCORD, MASS. Towns Concord and Carlisle Regional School Dist., Concord High School Auditorium, Stowe St., Concord, Mass. Bids Aug. 29. CD 9/4, under LB.

▲ **John Zanconella, Inc.**, 70 Chase St., Bridgeport, Conn. CA $1,113,100, 66,000 sq. ft. North End ELEMENTARY SCHOOL, Reservoir Ave., BRIDGEPORT, CONN. Town of Bridgeport Bd. Educ., 804 Main St., Bridgeport, Conn. Bids Sept. 3. CD 9/10, under LB.

Fusco-Amatruda Co., 59 Amity Rd., New Haven, Conn., LB $694,000 (8 bidders) 2 story, masonry SCIENCE BLDG. incl. planetarium and observatory, New Haven State Teachers College, NEW HAVEN, CONN. State P. Wks. Dpt., 165 Capitol Ave., Hartford, Conn. Bids Aug. 27. CD 8/6.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—LB & CA

Link Belt Co., Colmar, Pa. LB $863,007 (6 bidders), furnishing, del. towers, guides and sills for Lewiston Power Plant and conduit outlet stoplogs structure of waterways, Niagara Contr. NP-24, Spec. PA-N-23012, NEW YORK. The Power Auth. of State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, N. Y. Bids Sept. 11. CD 8/15.

▲ **Arthur A. Johnson Corp. & Peter Kiewit Sons Co.**, 347 Madison Ave., New York 17, N. Y. CA $8,944,117, subway connections Route 112, Sect. 3, extending under and along Chrystie St. private property and East Houston St., Stanton St. to Lafayette St. Manhattan Boro, NEW YORK, N. Y. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. Bids Aug. 15. CD 8/20, under LB.

Cronin Assocs., Inc., 33 Main St., Haverstraw, N. Y. LB $273,700, general constr. heating tunnels, Letchworth Village, THIELLS, N. Y. Dpt. P. Wks., State Office Bldg., Albany, N. Y. Bids Aug. 21. (Correction—contractor's address). CD 8/28, under LB.

▲ **PENNSYLVANIA**—Hy. Dpt., 506 North Office Bldg., Harrisburg,

Pa.—**Kauffman Bros.**, Green St., Langhorne, Pa., CA $586,746, (5 bidders), crushed aggreg. base with bit. surf. variable in width, 3 rein.-con. bridges T. R. 32 near Hope Boro, Solebury Twp., Bucks Co.;

Pa.—**Edward A. Daylor Co., Inc.**, Box 551 Coatesville, Pa., CA $965,910, (7 bidders), 35,146 ft. crushed aggreg. base with bit. surf. variable in width, 3 rein.-conc. bridges T. R. US 322, W. Brandywine, E. Brandywine and Caln Twps., Downington Boro, Chester Co. Bids Aug. 15, awarded Sept. 9. CD 8/19, under LB.

▲† **Central Pennsylvania Quarry, Stripping & Constr. Co.**, 270 S. Pine St., Hazelton, Pa., CA $1,286,254, constr. flood protective works, ALLENTOWN, PA. U. S. Eng., 2635 Abbottsford Ave., Phila., Pa. CD 8/22, under LB.

BUILDINGS—LB & CA

Empress Associates, Inc., c/o Vernon, 825 E. 140 St., New York 54, N. Y., Separate Contracts, $700,000, 6 story APARTMENT forf 98 families and 30-car GARAGE, 4011 Kings Hy., BROOKLYN, N. Y. Horace Ginsbern & Assocs., 205 E. 42 St., New York 17, N. Y., archts. CD 7/8.

Ramage Realty Corp., 1804 Sheepshead Bay Rd., Brooklyn 29, N. Y. Separate Contracts, $500,000, 6 story APARTMENT with 62 apartments and 25-car GARAGE, 2701 Ocean Ave., BROOKLYN, N. Y. S. Gardstein & Son, S. Court St., Brooklyn 2, N. Y., archts. CD 7/8.

▲ **174 E 74 St. Corp.**, 400 Madison Ave., New York 17, N. Y., Separate Contracts, $1,400,000, 17 story APARTMENT, 174 E. 74 St. and 1280-88 Third Ave., NEW YORK, N. Y. A. Rollin Caughey, 165 E. 72 St., New York 21, N. Y., archt. CD 4/8.

Bala, Inc., 69 E. 59th St., New York 22, N. Y. Separate Contracts, $784,000, APARTMENT, 209-15 E. 56 St., NEW YORK, N. Y. Pomerance & Breines, 33 W. 46 St., New York 19, N. Y., archts. CD 6/24.

▲ **Triumph Trading Corp.**, 350 Fifth Ave., New York, N. Y. Separate Contracts. $1,500,000, APARTMENT, 450 E. 79th St., NEW YORK, N. Y. A. Rollin Caughey, 165 E. 72 St., New York 21, N. Y., archt. CD 7/8.

▲ **George Van Horn, operating as Bossert Homes, Inc.**, Ward Ave., Bordentown, N. J. Owner Builds. $1,000,000, 75 addnl. HOUSES at Bossert Estates, Ward Ave. near Rte. 130, BORDENTOWN, N. J.

▲ **American Builders**, 523 Somerset St., North Plainfield, N. J. Owner Builds. $2,500,000, 100 HOUSES, Meyersville and River Rds., Chatham Twp., CHATHAM, N. J.

Carl F. Jacobelli, operating as Trenton Home Bldrs., Inc., 1646 No. Olden Ave. Ext., Trenton, N. J. Own Forces. $500,000, custom built HOUSES known as Hampton Hill, Pennington Rd., EWING TWP. (Trenton P.O.), N. J.

▲ **Frank M. Russo**, 14 Blackwood Dr., Trenton, N. J. Own Forces. $1,300,000, 50 HOUSES, off Mountain View Rd., EWING TWP. (Trenton P.O.), N. J.

John J. Klein, Crestwood Constr. Co., 143 E. State St., Trenton, N. J. Own Forces. $750,000, 60 HOUSES, White Horse Area, Englehard Blvd., HAMILTON TWP. (Trenton P.O.), N. J.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of Interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED
New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.

BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

▲ **Wallace Wilck, Inc.**, 1001 State St., Perth Amboy, N. J., CA $1,200,000, 2 story 60x120 ft. RESEARCH LABORATORY, George Rd.; CA $500,000, AUXILIARY RESEARCH LABORATORY, George St., NEW BRUNSWICK, N. J. E. R. Squibb & Sons, Div. of Olin Mathieson Chemical Co., 745 Fifth Ave., New York, N. Y.

United Constr. Co., 1204 Lincoln Ave., Pittsburgh 6, Pa., CA $751,500, general constr. SECONDARY SCHOOL BLDG. for Calif. Community Joint School Bd., CALIFORNIA, PA. Pa. P. School Bldg. Auth., 101 S. 25 St., Harrisburg, Pa. Bids Aug. 7. CD 8/12, under LB.

Henry A. Knott, 2406 Greenmount Ave., Baltimore 6, Md., CA $825,000 (6 bidders) brick, concrete, steel, block SCHOOL near BALTIMORE, MD. Park School, Old Court Rd., Baltimore 8, Md. Bids Aug. 15. CD 8/5.

Merando, Inc., 5098 Minnesota Ave. N.E., Wash., D. C., LB $767,526 (7 bidders) constr. Ruth K. Webb ELEMENTARY SCHOOL, Mt. Olivet Rd. and Holbrook St. N.E., WASH., D. C. D. C. Govt., Dpt. Bldgs. & Grounds, 499 Pa. Ave. N.W., Wash., D. C. Bids Sept. 9. CD 9/4.

▲ **John A. Volpe Constr. Co.**, 261 Constitution Ave. N. W., Wash., D. C., CA $3,424,000, MENS DORMITORY and CAFETERIA for Georgetown University, 37th and O Sts. N. W., WASH., D. C. Georgetown University, 37 and O Sts N. W., Wash., D. C. Bids Sept. 4. CD 9/8, under LB.

SOUTH

HEAVY CONSTRUCTION—BA

▲† **Florida**—BA 10/15—U. S. Eng., P. O. Box 4970, Jacksonville, Canal 40, Section 1, consists of imprv. approx. 6 mi portion of Indian Prairie Canal from Lake Okeechobee northwesterly to site of Structure 72, incl. some required levee constr., Structures 72 and 75 are gated 2-bay and 1-bay (respectively), rein.-con. spillway structures, complete with vertical lift gates electrically operated from an overhead platform, a rein.-con. service bridge, steel sheet pile cut-off and retaining walls, stone protection, access road to Structures 75 and other work, Central and Southern Florida Flood Control Proj., CIVENG-08-123-59-17. CD 9/6/57.

▲† **Kentucky and Tennessee**—BA On Or About 10/28—U. S. Eng., 306 Federal Office Bldg., Nashville, Tenn. constr. lock, Barkley Dam Site, Cumberland River, involving maintenance of existing sheet steel cellular type cofferdam and final removal of same; 1,350,000 cu. yd. earth and rock excav; constr. Navigation Lock 110 x 800 ft., 600,000 cu. yd. concrete, 2,300 tons steel reinforcement and wall armor and miter gates 1,400 tons; lock operating machinery, operation bldg. and control shelters, piping sys. and misc. items, Livingston Co. CIVENG-40-058-59-3. CD 9/5.

HEAVY CONSTRUCTION—LB & CA

▲† **Doyle & Russell**, 823 West 21 St., Norfolk, Va., CA $1,457,744. Data Reduction Center, LANGLEY FIELD, VA. National Advisory Committee for Aeronautics, Langley Field, Va. CD 8/12, under LB.

▲ **WEST VIRGINIA**—State Road Comn., Charleston, Zone 5. Bids opened 9/9,

Boso & Ritchie, Inc., Ravenswood, W. Va., LB $1,959,593, grading, draining, structures 2.017 mi. Interstate Hy. 77, Proj. I-77-3(5)121, Jackson Co. CD 8/25.

The Lee Constr. Co., 311 W. Worthington Ave., Charlotte, N. C., LB $823,719. Section 2 imprv. enlargement of Columbias Water Treatment Plant which will raise daily treatment capacity from 27 to 36 m. g. d.; enlargement present Chemical Bldg., constr. six 11½ m. g.. filters and installation two more settling basins complete with flocculators all with necessary connecting pipes, valves and other equip., COLUMBIA, S. C. City, City Hall, Columbia, S. C. Bids Sept. 9. CD 8/13.

▲ **FLORIDA**—State Rd. Dpt., Tallahassee,

H. E. Wolfe Constr. Co., Box 1361, St. Augustine, Fla., CA $1,558,749, double lane single roadway into a 4 lane dual roadway facility, heavy excavations rework and widen existing rock base binder course resurf. approx. 10 mi. existing pavement asph. conc., constr. 276 and 295 ft. single road concrete slab deck bridges on concrete, pile 5-concrete box culverts of bridge lengths small drainage structures etc. 17.424 mi. FAI Proj. No. F-003-7 (17) Jobs Nos. 72080-3107 and 74030-3111 SR 15 (US 23) Duval and Nassau Counties. Bids Aug. 26, awarded Sept. 10. CD 8/29, under LB.

† **Tri-State Constr. Co.**, Chipley, Fla., LB $789,300. est. $894,552, earth dam, left bank Chattahoochee River, Clay Co., ENG-01-076-59-1, ALABAMA and GEORGIA. U. S. Eng., 2301 Grant St., Mobile, Ala. Bids Sept. 4. CD 8/13.

M & L Constr. Co., Box 95, Kaplan, La., CA $542,000. 4.5 m. g. d. water treatment plant; 3 m. g. d. gravity filters, high service pump station, chemical bldg. addn., LAFAYETTE, LA. City, City Hall, Lafayette, La. Bids Aug. 26. CD 8/21.

BUILDINGS—LB & CA

▲ **Home Insulation Co.**, 1101 Vanderbilt Rd., Birmingham, Ala., Owner Builds, **$1,125,000**, one hundred twenty-five 3-bedroom HOMES, Rosedale Heights subdivision for Negroes, BIRMINGHAM, ALA.

▲ **Southern Builders, Inc.**, 491 W. 61 and Box 1815, Shreveport, La., LB **$1,384,000** Unit A-2 MEN'S DORMITORIES; Unit B-2 WOMEN'S DORMITORIES, GRAMBLING, ALA. Louisiana State Bd. Educ., Grambling College, Grambling, La. Bids Sept. 4. CD 8/14. **Jesse F. Heard & Son**, Box 3566, West Monroe, La., LB **$547,000**, Unit C, STUDENT UNION (Grambling, La.).

Hargett Constr. Co., 113 Walton Ave., Lexington, Ky., LB **$584,455** (5 bidders) BOWLING ALLEY, LEXINGTON, KY. Eastland Bowling Lanes, Inc., c/o Brock & Johnson, archts., 159 Barr St., Lexington, Ky. Staggs & Fisher, 508 E. Main St., Lexington, Ky., engrs Bids Sept. 9.

MIDDLE WEST

BUILDINGS—BA

▲ **Ill., Alton**—HOSPITAL—BA 10/28—Alton Memorial Hospital, Memorial Drive, 4 story hospital wing addn. $1,700,000. Plans deposit $100 complete set or $25. each separate set on any section of plans. Maguolo & Quick, 4908 Delmar Blvd., St., Louis 8, Mo., archts-engrs. CD 11/11.

HEAVY CONSTRUCTION—LB & CA

▲ **INDIANA**—State Hy. Comn., John Peters, chn., State House Annex, Indianapolis,

Ind.—**S. J. Groves & Sons**, 1104 W. Reynolds St., Springfield, Ill., CA **$1,181,564**, est. $1,349,824, c. conc. 2.083 mi. US 136, Contr. R-4506, Vermillion and Fountain Counties, Bids July 29;

Ind.—**Olinger Constr. Co.**, Huntingburg, Ind., CA **$2,407,064**, est. $2,543,223, c. conc. 5.369 mi. US 31, Contr. R-4505, Clark Co., CD 8/5, under LB.

INDIANA—State Hy. Dpt., John Peters, chn., State House Annex, Indianapolis,

Vogel Constr. Co., 3760 E. St. Clair St., Indianapolis, Ind., CA **$715,956**, est. $720,760, rein.-con., cement, base wid'n. and bit. resurf. 3.084 mi. SR 67 and 144, Contr. R-4403, Morgan and Hendricks Counties, Bids May 27, CD 6/5, under LB.

▲ **INDIANA**—State Hy. Dpt., John Peters, chn., State House Annex, Indianapolis,

Rieth-Riley Constr., West Madison St., Goshen, Ind., CA **$2,090,052**, est. $2,317,799, c. conc. 6.079 mi. US 31, Contr. R-4397, Jackson Co. Bids Apr. 29, CD 5/8, under LB.

▲ **MICHIGAN**—State Hy. Dpt., John C. Mackie, state hy. comr., Stevens T. Mason Bldg., Lansing, Bids opened 9/3,

Mich.—**L. W. Edison Co.**, 3134 Midland Dr. S.E., Grand Rapids, Mich., LB **$3,175,402**, est. $3,640,000, dual 24-ft. concrete pavement ramps and 4 bridges 8.674 mi. US-16 relocation from Whitneyville Rd., Whitneyville. FAI Proj. BI B1 024 C2-RN (I C4-2-11 BI B1 of 41-8-5 C1 RN BI B1 of 4-13-5 CL-RN BU B2 of 41-13 5 C1 RN BI B3 of 41-13-5 C1-RN, Kent Co. CD 8/21;

Mich.—**Bairley & Lindley**, 4000 W. Jefferson St., Trenton, Mich., LB **$1,259,658**, est. $1,130,000, 36 ft. concrete pavement 10-in. uniform curb and gutter, bridge structures 2.498 mi. US-24 from Oxford Rd. in Dearborn, U 82052 C12-U U 82053 C1 U (U 87 8) Part I U B1 of 82-3 1 C7 (U 87 8), Wayne Co. CD 8/21;

Mich.—**Julius Porath & Son**, 12201 Beech Daly, Detroit 39, Mich., LB **$2,049,165**, est. $2,310,000, dual 24 ft. concrete pavement 9-in. uniform concrete base course b. conc. surf. and 3 bridges 5.748 mi. US-25 from Telegraph north to Northline Rd. BF 82071 C4-R (F 130 13) BF B1 of 82-1-3 C2-R BF B3 of 82-1-3 C3-R 82071 (F 130 13), Wayne Co. CD 8/21.

BUILDINGS—LB & CA

Frank Messer & Sons, Inc., Paddock Rd., Cincinnati, O. CA **$500,000**, 36,000 sq. ft. CINCINNATI GARDENS (SPORTS CONVENTION BLDG. addn.), concrete block, brick, CINCINNATI, O. Cincinnati Gardens, Inc., Seymour Ave., Cincinnati, O. Robert A. Kennedy, 2065 Francis Lane, Cincinnati, O., archt. Engineer, c/o Steelcraft Mfg. Co., Rossmayne, engr.

▲ **Frank Messer & Sons, Inc.**, Raddock Rd., Cincinnati, O. CA **$1,000,000** (6 bidders) GARAGE BLDG., CINCINNATI, O. Emery Realty Inc., Carew Tower, Cincinnati, O. CD 3/26.

▲ **S. M. Wilton & Co.**, 1616 Cleveland Ave., Granite City, Ill., LB **$1,199,916**, (3 bidders) general contract 1 story, brick, steel, concrete Granite City JUNIOR HIGH SCHOOL, 2300 W. 25 St., 1 story, brick, concrete ELEMENTARY SCHOOL, 4651 Maryville Rd., 1 story brick, concrete, etc. ELEMENTARY SCHOOL, 3201 E. 23 St., 1 story, brick, concrete, etc. ELEMENTARY SCHOOL, 2400 Wilson Ave., GRANITE CITY, ILL. Community Unit School Dist. No. 9, 3100 Madison St., Granite City, Ill. Bids Sept. 3. CD 8/27. **General Contracting Co.**, 2200 Monroe St., Granite City, Ill., LB **$824,000**, general contract for 3 ELEMENTARY SCHOOLS (Granite City, Ill.); **Thomas McEvilly Plumbing & Heating Co.**, 707 St. Louis Ave., East St. Louis, Ill. LB **$629,073**, plumbing and heating contract all schools (Granite City, Ill.).

Henkel Constr. Co., 525 9 St. S.E., Mason City, Iowa, CA **$504,405**, general contract INFIRMARY and KITCHEN addn., Reedsburg, BARABOO, WIS. Sauk Co., Reedsburg, Wis. Bids Aug. 12. CD 8/27, under LB.

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WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲† **Tex., Keller** — AIR ROUTE TRAFFIC CONTROL CENTER—BA 10/3—General Services Admin., 1114 Commerce St., Dallas, Zone 2, constr. air route traffic control center for Civil Aeronautics Admin. $1,500,000. Thos. B. Bourne Assoc., Inc., Dupont Circle Bldg., Wash., D. C., archt. CD 8/13.

▲† **Texas**—BA 10/23—U. S. Eng., Box 1600, Fort Worth, 2nd stage of embankment for McGee Bend Dam. $1,000,000. CD 9/14/56.

BUILDINGS—BA

Minn., Richfield (P.O. Minneapolis)—SCHOOL—BA 10/7—Bd. Educ., 1 story elementary school, 74th St. and Bloomington Ave. $790,000. Ellerbe & Co., E. 505 First Natl. Bank Bldg., St. Paul, archts. CD 8/29, under LB.

Iowa, Davenport—DORMITORY—BA About 10/15—St. Ambrose College, 518 W. Locust St., 4 story dormitory bldg. $920,000. William F. Bernbrock, Fifth Ave. Bldg., Moline, Ill., archt. CD 9/4.

BUILDINGS—SLC

▲ **Iowa, Ottumwa**—OFFICES, DORMITORIES, etc.—Ottumwa Heights College, Sisters of the Humility of Mary, soon lets contract central offices, dormitories, etc., $2,500,000, Leo A. Daly Co., 633 Insurance Bldg., Omaha, Neb., archt. CD 8/8.

HEAVY CONSTRUCTION—LB & CA

▲† **Peter Kiewit & Sons,** Box 917, Sheridan, Wyo. CA **$3,250,764,** constr. alert facilities, Minot Air Force Base, ENG-25-066-59-8, MINOT, N. D. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Aug. 5. CD 8/11, under LB.

KANSAS—State Hy. Comn., Kansas City,

J. A. Tobin Constr. Co., 3701 Rainbow Blvd., Kansas City, Kan. CA **$618,959,** grading, concrete paving 0.36 mi. beginning on Muncie Expressway and Splitlog Ave. extending northerly Interstate 70 to point near west end of Inter-city Viaduct, SP No. 70-105 I 70-6 (8) 423, Wyandotte Co. Bids Sept. 4. CD 9/9, under LB.

▲ **KANSAS**—State Hy. Comn., Kansas City,

L. G. Barcus & Sons, Inc., 1430 State Ave., Kansas City, Kan. CA **$1,128,610,** Unit No. 1-138 ft., 7 at 184 ft., 138 ft. steel girder; Unit No. 2, 60 ft., 4-80 ft., 72 ft., 54 ft., steel beam bridge over Kansas River, southeast of Bonner Springs on new location K-7. Br. No. 7-105-0.03 Sta. 60 plus 26, SP No. 7-105 F 081-1 (4), Wyandotte Co. Bids Sept. 4. CD 9/9, under LB.

▲† **Chicago Bridge & Iron Co.,** 550 W. 17th St., Salt Lake City, Utah. LB **$4,624,100,** est. $8,263,295 (12 bidders) penstocks, tunnel-liner and surge tanks for 2nd power plant at Fort Peck, ENG-32-015-58-9, MONTANA. U. S. Eng., Glasgow, Mont. Bids Sept. 10. CD 8/22.

▲ **NEW MEXICO**—State Hy. Comn., State Hy. Bldg., Cerillos Rd., Santa Fe,

N. M.—Allison & Haney, Inc., P. O. Box 1507, Albuquerque, N. M., CA **$1,422,824,** Menaul-Lomas, Albuquerque, Proj. No. I-025-4(10)221, Bernalillo Co.;

N. M.—J. W. Jones Constr. Co., P. O. Box 8038, Albuquerque, N. M., CA **$776,487,** Las Vegas-North, Proj. No. I-025-5(7)346 and F-001-5(8), San Miguel Co. Bids July 25. CD 7/30, under LB.

BUILDINGS—LB & CA

Associated Builders, Virginia, Minn., CA **$652,700,** general contract, SCHOOL addn. and remodel existing Bldg., EMBARRASS, MINN. St. Louis Co. Bd. Educ. Unorganized Territory, Court House, Duluth, Minn. Bids July 23. CD 7/29, under LB.

Henkel Constr. Co., Box 920, Mason City, Iowa, CA **$595,595,** 2 story, 90 x 110 ft. County HOSPITAL, FARIBAULT, MINN. Bd. Comrs. Rice Co., Faribault, Minn. Bids Aug. 19. CD 8/26, under LB.

▲ **Johnson, Drake & Piper, Inc.,** Baker Bldg., Minneapolis, Minn., LB **$4,386,000** (4 bidders), Glenwood Homes, 278 DWELLING UNITS, Bryant and Emerson Aves., north from Olson Hy. to Glenwood Ave., MINNEAPOLIS, MINN. Minneapolis Housing & Redevelopment Auth., Metropolitan Bldg., Minneapolis, Minn. Bids Sept. 11. CD 8/12.

C. H. Peterson Constr. Co., 4020 Minnetonka Blvd., Minneapolis, Minn., CA **$958,600,** general contract 1 story, 14-classroom JUNIOR HIGH SCHOOL, and 2 story section for PHYSICAL EDUCATION, etc. MOUND, MINN. Bd. Educ., Mound, Minn. Bids Aug. 15. CD 8/25, under LB.

B. I. Johnson & Son Co., 848 West 79th St., Minneapolis, Minn., LB **$938,130** (10 bidders), SCIENCE and MATHEMATICS BLDG. at St. Cloud State College, ST. CLOUD, MINN. State Dpt. Admin., 19 State Capitol, St. Paul, Minn. Bids Sept. 9. CD 8/19.

Walnut Groves Products Co., Atlantic, Iowa, Separate Contracts, **$600,000,** FEED PLANT, 40,000 tons of feed supplements annually, CHEROKEE, IOWA.

▲† **B. H. Baker Incorp.,** 2605 North Circle Dr., Colorado Springs, Colo., LB **$3,144,069,** HOSPITAL, Air Force Academy, IEB-05-613-58-069, COLORADO SPRINGS, COLO., Dpt. Air Force, Box 1670, Colorado Springs, Colo., Bids Sept. 9, CD 7/30.

▲ **Meade & Mount Constr. Co.,** Denver Club B, Denver, Colo., LB **$3,933,000,** general contract, George Washington HIGH SCHOOL, DENVER, COLO. School Dist. No. 1, 414 14th St., Denver, Colo., Bids Sept 3, CD 8/18;

Dependable Plumbing, 4700 W. Colfax Ave., Denver, Colo., LB **$963,300** mechanical work George Washington High School, (Denver, Colo.);

Howard Electric Co., 1170 W. Custer Place, Denver, Colo., LB **$347,000** electrical work George Washington High School, (Denver, Colo.)

FAR WEST

HEAVY CONSTRUCTION—LB & CA

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles, Bids opened 9/11,

R. E. Hazard Contg. Co. and W. F. Maxwell Co., 7501 Friars Rd., San Diego, Calif. LB **$1,213,980,** (7 bidders), 1.3 mi. 8 lane freeway US Hy. 80 between 0.2 mi. west and 1.2 mi. east of Taylor St., incl. interchange sys., 164 ft. bridge over freeway at Presidio Park. XI-S.D.-12, S.D. San Diego Co. CD 8/13.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles, Bids opened 9/11,

Ukropina, Polich & Kral, Box 105, San Gabriel, Calif. LB **$7,576,081,** (7 bidders), constr. 4.9 mi. 8 lane divided freeway (Harbor Freeway) between 0.2 mi. north of 124th St. and ½ mi. south of 190th St., incl. 17 bridges, 10 retaining walls and 2 pumping plants VII-L.A.-165-LA, A. Los Angeles Co. CD 8/6.

▲† **Guy F. Atkinson Co.,** 10 West Orange Ave., South San Francisco, Calif. LB **$6,480,768** est. $6,820,000 (13 bidders) constr. Success Dam on Tule River, Tulare Co., involving earth-rock fill dam, 3,500 ft. long, 140 ft. high, earth fill dike, 7,600 ft. long and 40 ft. high, 1,340,000 cu. yd. unclassified excav., 6,050,000 cu. yd. borrow excav., 1,097,000 cu. yd. impervious compacted fill, 850,000 lb. reinforcing steel, Spec. 2280A ENG-04-167-59-8, CALIFORNIA, U. S. Eng., 1209 8th St., Sacramento, Calif. Bids Sept. 11. CD 7/17.

Charles L. Burch & Sons, 2419 N. Chicago Ave., El Monte, Calif. LB **$548,607,** (10 bidders), storm drain, East Olympic Blvd., Vernon, Proj. 90, LOS ANGELES, CALIF. Los Angeles Co. Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. Bids Sept. 5. CD 8/13.

▲ **T. M. Page Corp.-R.C.R. Corp.,** 145 N. Duarte Ave., Monrovia, Calif., CA **$1,123,027,** est. $2,000,000, constr. rein.-con. conduit for Dominguez Channel from Grammercy Place to Denker Ave., in cities of Gardena and Torrance, LOS ANGELES, CALIF. Los Angeles Co. Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. Bids Aug. 15. CD 8/22, under LB.

G. Vella Constr. Co., 1212 E. Huntington Dr., Duarte, Calif., LB **$917,635,** est. $715,000, (7 bidders), Proj. 85, storm drain in R/W North of S. P. R. R., Van Nuys, LOS ANGELES, CALIF. Los Angeles Co. Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. Bids Aug. 22. CD 7/30.

BUILDINGS—LB & CA

▲ **China Lake Housing Corp.,** 650 W. Los Robles Ave., Flintridge, Calif., Owner Builds. **$2,298,802** 150 stucco double DWELLINGS, at Ridgecrest, CHINA LAKE, CALIF.

▲ **Dike & Colgrove,** 419 E. 17 St., Garden Grove, Calif. CA **$1,200,854,** 76 stucco DWELLINGS, Villanova, Nassau, and Loyola Rds., COSTA MESA, CALIF. Carlsen & Meddlebrook, 13041 Brookhurst St., Garden Grove, Calif., archts.

Tietz Constr. Co., 11900 Gilbert St., Garden Grove, N. J. Owner Builds, **$893,000,** 74 frame, stucco DWELLINGS, Lots No. 1, 74, Tract 1707, GARDEN GROVE, CALIF.

▲ **Robert E. McKee, Inc.,** 4701 San Fernando Rd., West Los Angeles, Calif. CA **$7,086,900** constr. NEURO-PSYCIATRIC INSTITUTE at University of California Medical Center, LOS ANGELES, CALIF. Regents University of Calif., Admin. Bldg., 405 Hilgarde St., Los Angeles, Calif. Bids July 29. CD 8/4, under LB.

McNeil Constr. Co., 5858 Wilshire Blvd., Los Angeles, Calif. CA **$900,000,** 2 story brick LIBRARY, LOS ANGELES, CALIF. Loyola University of Los Angeles, 7108 W. 80 St., Los Angeles, Calif. Albert C. Martin & Assocs., 333 S. Beaudry St., Los Angeles, Calif., archts.

Meredith Constr. Co., Box 468, Tustin, Calif. CA **$624,000** 20 frame, stucco DWELLINGS, in Tract 3169, SANTA ANA, CALIF., Vied Constr. Co., Box 468, Tustin, Calif.

CANADA

HEAVY CONSTRUCTION—BA

▲ **Ont., Sarnia**—BA 10/27—City, City Hall, sewage treatment plant, main bldg. brick faced masonry superstructure on rein.-con. substructure with pile foundation, (b) installing pumps, motors, controls, generator, etc. (c) constr. pipe outlet for sewage treatment plant, constr. riverfront interceptor sewer. $4,200,000. Plans deposit $100. James F. MacLaren Assoc., 321 Bloor St. E., Toronto, engrs. CD 3/6/53.

BUILDINGS—BA

▲ **Ont., Chatham**—HOSPITAL—BA 10/8—Ontario Dpt. P. Wks., Parliament Bldgs., Toronto, 1300 patient hospital, $3,700,000. CD 12/5.

▲ **Alta., Calgary**—POST OFFICE TERMINAL—BA 10/22—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., post office terminal, 9 Ave. and 1st. St. W. $4,000,000. Plans deposit $400. Rule, Wynn & Rule, 513 8th Ave. W., archts. CD 2/17/55.

HEAVY CONSTRUCTION—LB & CA

▲ **ALBERTA**—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., **Standard Gravel & Surfacing of Canada Ltd.,** 5340 1st. St. S.W., Calgary, Alta. CA **$1,332,605,** grading culverts and base course Mile 46 to Mile 58 and constr. North Saskatchewan River bridge, Mile 47.9 Jasper-Banff Hy., Banff National Park, Banff. Bids July 17, awarded Sept. 5. CD 7/28.

▲ **ALBERTA**—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont.

Storms Contg. (Pacific) Ltd., 342 Pender St. W., Vancouver, B. C. CA **$1,019,862,** grading culverts, base course and prime, 9.7 mi., Mile 58 to Mile 67.7, Banff-Jasper Hy., Banff National Park, Alberta, Banff. Bids July 22. CD 7/31.

BRITISH COLUMBIA—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont.,

General Constr. Co. Ltd., Granville Island, Vancouver, B. C., CA **$784,724,** grading, culverts and bridge constr., Trans Canada Hy., Mile 18.7 to Mile 23.3 Glacier National Park, Glacier. Bids July 15, awarded Sept. 5. CD 7/23, under LB.

▲ **BRITISH COLUMBIA**—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont.,

Rush & Tompkins (Canada) Ltd., 10020-103 St. Edmonton, Alta., CA **$2,247,718,** grading, culverts, Mile 6 to Mile 9.7 Trans Canada Hy., Glacier National Park, Glacier, Bids July 3. CD 7/14, under LB.

▲ **BRITISH COLUMBIA**—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont.,

Emil Anderson Constr. Co. Ltd., 4 Ave., Hope, B. C. CA. **$1,226,354,** grade culverts, Mile 9.7 to Mile 12.41 Trans-Canada Hy. Glacier National Park, Glacier. Bids July 31, awarded Sept. 5. CD 8/12.

BUILDINGS—LB & CA

Frid Constr. Co. Ltd., 605 James St. N., Hamilton, Ont. CA **$636,300,** PHYSICAL SCIENCE BLDG. and PHYSICAL PLANT BLDG., HAMILTON, ONT. McMaster University, Hamilton, Ont. Bids Aug. 6, awarded Sept. 4. CD 8/28, under LB.

▲ **Louis Donalo (Ontario) Ltd.,** 2790 Dufferin St., Toronto, Ont., CA **$1,997,218,** (15 bidders) two APARTMENT BLDGS. one L-shaped 10 and 11 stories 180 x 45 x 150 ft. and one 2 story, 45 x 350 ft. rein.-con. frame masonry, Queen St. W. and Lansdowne Ave., TORONTO, ONT. Metropolitan Toronto Housing Co. Ltd., 203 Sackville St., Toronto, Ont. Awarded Sept. 9. CD 8/14, under LB.

▲ **Foundation Co. of Canada Ltd.,** 1900 Sherbrooke St. W., Montreal, Que., CA Est. **$8,000,000** (16 bidders) constr. HYDRO-ELECTRIC POWER PLANT at Iron More Mine, on Hart Jaune River in St. Lawrence watershed, SHELTER BAY, QUE. Quebec Cartier Mining Co., 1255 Laird Blvd., Mount Royal, Que. Bids July 7. CD 6/13.

AMERICANS ABROAD

BUILDINGS—BA

▲† **Panama Canal Zone**—HOUSING—BA About 11/4—U. S. Eng., Box 4970, Jacksonville 1, Fla., 330 units Capehart Family Housing, Pacific Side, ENG-08-123-59-7. $5,424,852.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Ill., Highland Park**—City, 1707 St. Johns Ave., water treatment facilities and water reservoir, $2,500,000. Greeley & Hansen, 220 S. State St., Chicago, Zone 4, consult. engrs. Bids in spring.

▲ **New Jersey**—State of New Jersey, Trenton, $45,850,000 bond election Nov. 4, water development of Raritan River Basin. CD 6/1/44.

SEWERS, WASTE DISPOSAL

▲ **D. C., Wash.**—D. C. Govt. Dpt. Bldgs. & Grounds, 499 Pa. Ave. N. W., Incinerator No. 4. $2,800,000.

▲ **Pa., Phila.**—Dpt. Procurement, City Hall Annex, Wakeling Street relief sewerage sys. $4,500,000. Morris Knowles, Inc., Park Bldg., Pittsburgh, Pa., consult. engr.

EARTHWORK, WATERWAYS

▲† **Pennsylvania**—Schuykill County Bd. of County Comm., Schuykill County Bd. of District Directors, Kingstown, Pa. and Carbon County Bd. of District Directors, Weatherly, Pa., Berks County Board of District Directors, Bethel, 86,848 acres watershed protection, Little Schuykill River Watershed for Soil Conservation Service, Dpt. Agriculture, **$2,259,322.**

AIRPORTS

▲† **Ariz., Tucson**—OPERATIONAL FACILITIES; etc.—U. S. Eng., 751 S. Figueroa St., Los Angeles, operational and training maintenance and supply facilities, utilities, Davis Monthan Air Force Base, **$4,174,000.** CD 9/24/57.

▲† **Ariz., Yuma**—OPERATIONAL and TRAINING FACILITIES—Public Works Officer, 12th Naval Dist., Federal Office Bldg., San Francisco, Calif., operational and training facilities and real estate, Marine Corps Auxiliary Air Station, **$8,946,000.**

▲† **Ark., Blytheville** — NIKE GUIDED MISSILE INSTALLATIONS—Dpt. Air Force, Pentagon, Wash., D. C., 2 Nike guided missile installations, a control area and launching area. **$3,000,000.**

▲† **Ark., Little Rock**—OPERATIONAL FACILITIES, etc.—U. S. Eng., P.O. Box 867, Little Rock, operational and training and supply facilities and utilities, Little Rock Air Force Base. $3,463,000. CD 11/22/55.

▲ **Calif., Beale Air Force Base**—OPERATIONAL AND TRAINING FACILITIES—U. S. Eng., 1209 8th St., Sacramento, operational and training, maintenance, supply, hospital, administrative, and community facilities and utilities, **$7,868,000.** CD 11/16/56.

▲† **Calif., Castle Air Force Base**—OPERATIONAL FACILITIES—U. S. Eng., 180 New Montgomery St., San Francisco, operational and training facilities, troop housing, utilities, Merced. **$4,183,000.**

▲† **Calif., El Toro**—OPERATIONAL FACILITIES, etc.—Eleventh Naval Dist., 1220 Pacific Hy., San Diego, operational and training facilities, Marine Corps Air Facility. **$2,158,000.** CD 2/27.

▲† **Calif., Lenmore**—OPERATIONAL FACILITIES, etc.—Dpt. P. Wks., 12th Naval Dist., San Bruno, operational and training, troop housing, community, administrative, supply facilities and utilities and ground imprvs., Naval Air Station. **$15,823,000.** CD 4/10.

▲† **Calif., March Air Force Base**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 751 S. Figueroa St., Los Angeles, operational and training and supply facilities, utilities, March Air Force Base. **$3,344,000.** CD 9/19.

▲† **Calif., San Diego**—OPERATIONAL FACILITIES, etc.—Eleventh Naval Dist., 1220 Pacific Hy., operational facilities and real estate, Naval Air Station, North Island. **$7,000,000.** CD 9/17.

▲† **Calif., Travis Air Force Base**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 1209 8th St., Sacramento, operational and training and supply facilities and utilities, Fairfield. **$2,997,000.** CD 2/7.

▲† **Del., Dover**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 2635 Abbottsford Rd., Phila. Pa., operational and training facilities, maintenance facilities, and utilities, Dover Air Force Base, **$2,784,000.** CD 8/23/56.

▲† **Fla., Cocoa**—OPERATIONAL FACILITIES, etc.—U. S. Eng., P. O. Box 4970, Jacksonville, operational and training facilities, maintenance facilities, troop housing and community facilities, Patrick Air Force Base, $2,884,000. CD 3/24/49.

▲† **Fla., Eglin Air Force Base**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 2301 Grant St., Mobile, Ala., operational and training, maintenance, research, development and test supply facilities, utilities, and real estate, Valparaiso. **$10,109,000.** CD 8/22/56.

▲† **Fla., Mayport**—OPERATIONAL FACILITIES, etc.—Dpt. P. Wks. Office, U. S. Naval Base, Charleston, S. C. operational and training supply and community facilities, utilities and real estate, Naval Auxiliary Air Station. **$9,892,000.** CD 10/20/50, under Unclassified.

▲† **Fla., Milton**—OPERATIONAL FACILITIES, etc.—P. Wks. Office, 6th Naval Dist., Charleston, S. C., operational and training facilities, utilities and ground imprvs. and real estate, Naval Auxiliary Air Station, Whiting Field. **$4,679,000.** CD 8/22.

▲† **Fla., Panama City**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 2301 Grant St., Mobile 7, Ala., operational and training facilities, maintenance facilities, and utilities, Tyndall Air Force Base. **$3,992,000.**

▲† **Ga., Albany**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 200 East St. Julian St., Savannah, operational and training maintenance, supply, troop housing community and facilities, utilities, Turner Air Force Base. **$5,474,000.** CD 9/18/57.

▲† **Ga., Macon**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 200 E. St. Julian St., operational and training, maintenance and supply facilities, and utilities, Robbins Air Force Base. **$4,362,000.** CD 9/18/57.

▲† **Ga., Savannah**—OPERATIONAL FACILITIES—U. S. Eng., 200 E. St. Julian St., operational and training, supply facilities and utilities, Hunter Air Force Base. **$4,493,000.** CD 9/18/57.

▲† **Ga., Valdosta**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 200 E. St. Julian St., operational and training, utilities, troop housing, Moody Air Force Base. **$5,432,000.** CD 9/18/57.

▲† **Ind., Peru**—OPERATIONAL AND TRAINING FACILITIES, etc.—Ninth Naval Dist., Great Lakes Naval Training Station, Great Lakes, Ill., operational and training and maintenance facilities, troop housing, and utilities, Bunker Hill Air Force Base. **$7,996,000.** CD 9/16/57.

▲† **Kan., Salina**—OPERATIONAL FACILITIES, etc.—U. S. Eng., Federal Office Bldg., Kansas City, Mo., operational, training and supply facilities, utilities, Schilling Air Force Base. **$2,352,000.** CD 9/17.

▲† **Kan., Topeka**—OPERATIONAL FACILITIES, etc.—U. S. Eng., Federal Office Bldg., Kansas City, Mo., operational training, supply and community facilities and utilities, Forbes Air Force Base. **$2,703,000.** CD 9/17.

▲† **Kan., Wichita**—OPERATIONAL FACILITIES, etc.—U. S. Eng., Federal Office Bldg., Kansas City, Mo., operational and training facilities, McConnell Air Force Base. **$2,119,000.** CD 2/2/51.

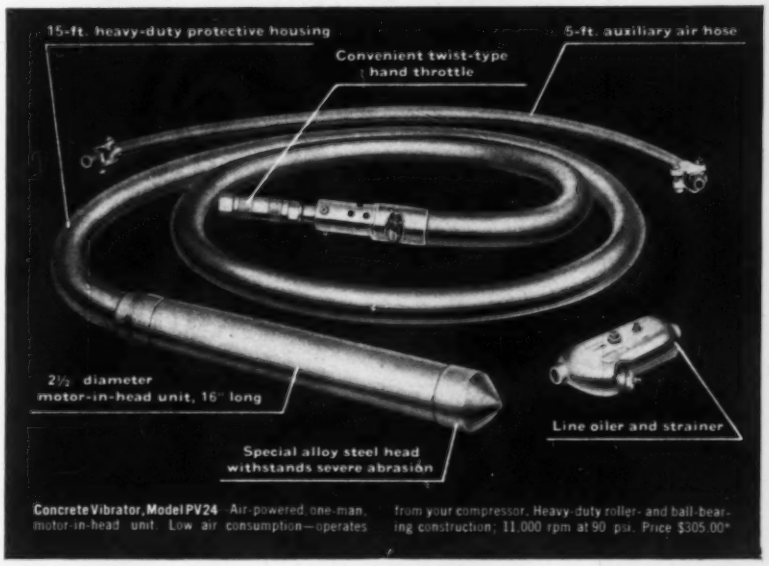
▲† **La., Lake Charles**—OPERATIONAL FACILITIES, etc.—U. S. Eng., Box 1229, Galveston, Tex., operational and training and supply facilities, Lake Charles Air Force Base. **$3,401,000.** CD 8/25/55.

▲† **La., Shreveport**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 300 Broadway, Little Rock, Ark., operational and training facilities, troop housing and utilities, Barksdale Air Force Base. **$4,280,000.** CD 9/18.

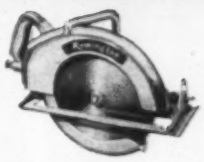
▲† **Me., Bangor**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 150 Causeway St., Boston, Mass., operational and training, maintenance, supply facilities,

(Continued on page 90)

POWER to boost job efficiency with REMINGTON tools

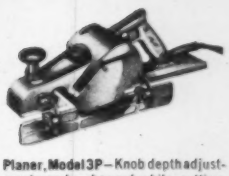

15-ft. heavy-duty protective housing
Convenient twist-type hand throttle
5-ft. auxiliary air hose
2½" diameter motor-in-head unit, 16" long
Special alloy steel head withstands severe abrasion
Line oiler and strainer

Concrete Vibrator, Model PV24—Air-powered one-man, motor-in-head unit. Low air consumption—operates from your compressor. Heavy-duty roller- and ball-bearing construction; 11,000 rpm at 90 psi. Price $305.00*



Air circular saw, Model P128—12" blade. Husky 2½-hp motor safe from shock hazard around wet piers and wharfs. With case, blade and hose. **Price $345.00***

Generator Set, Model 3WAS—3,000 watts capacity, 25 amp. AC at 115 v.; 60-cycle; four take-off plugs. Reliable Wisconsin 8-hp engine. **Price $525.00***



Planer, Model 3P—Knob depth adjustment can be changed while cutting. Fast, easy to operate; 8.4-amp, 115-v., AC/DC motor; weight: 15 lbs. **Price $170.00***

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Pressure-creosoted guardrail posts

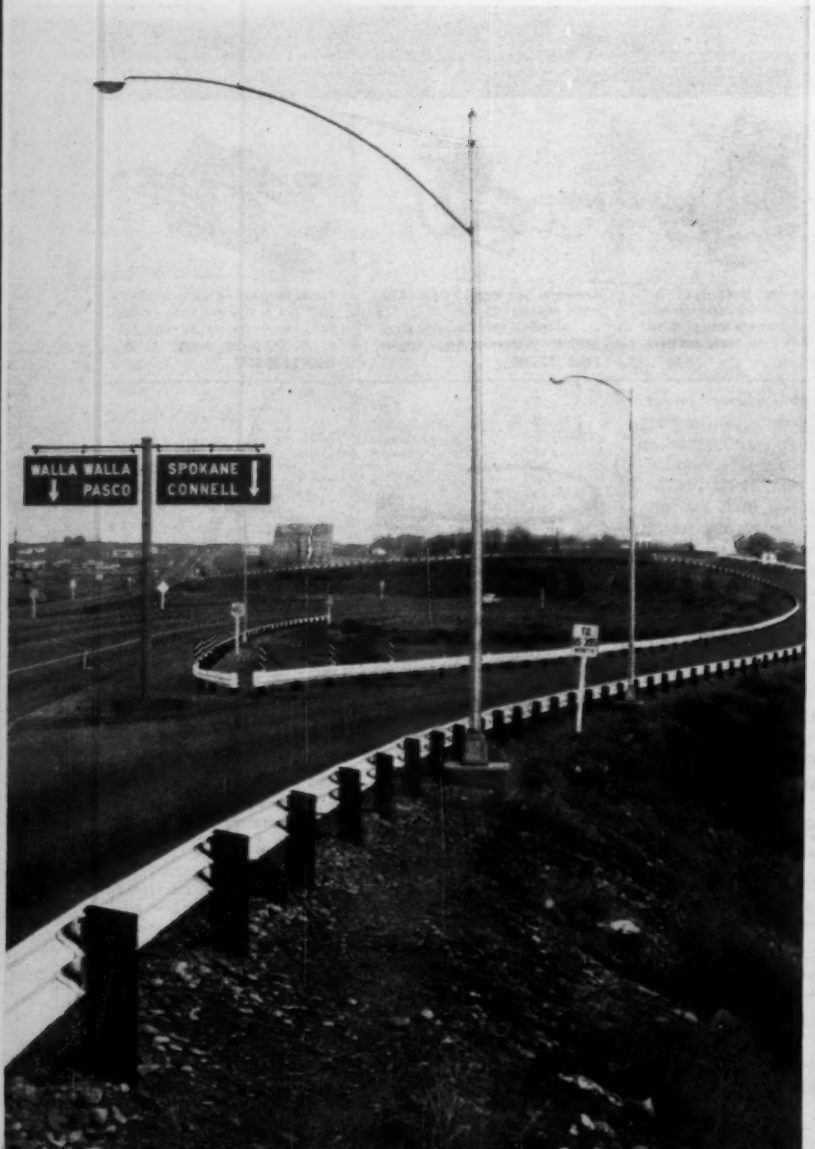
On Washington State Highways

This handsome guardrail installation is on the Pasco approach of the Columbia River Bridge, U. S. Route 410, in Washington State. It includes 400 pressure-creosoted posts 8″ x 8″ square and 5′4″ long, supporting a 14-inch steel guardrail.

The contract was won with a low bid of $13,039 by Sather and Son of Yardley, Washington. Pressure-creosoted posts were selected because they were good-looking, had high resistance to impact and promised to save tax money for 18 or 20 years to come.

Installation costs were less because the men could handle the posts without

Pressure-creosoted posts keep maintenance costs low on these guardrails and provide good protection and good looks, too.



last longer... save tax money

bringing in extra machines. Maintenance is low because the flexibility of the posts lessens the possibility of damage from impact, and pressure creosoting protects the posts from rot and wood-destroying insects.

The resident engineer, Mr. Lloyd H. Mackey, says that pressure-creosoted posts are used on a large percentage of the guardrail installations in his 1200 miles of territory. He has been on the job for 14 years and most of the creosoted posts installed before he came are still in use.

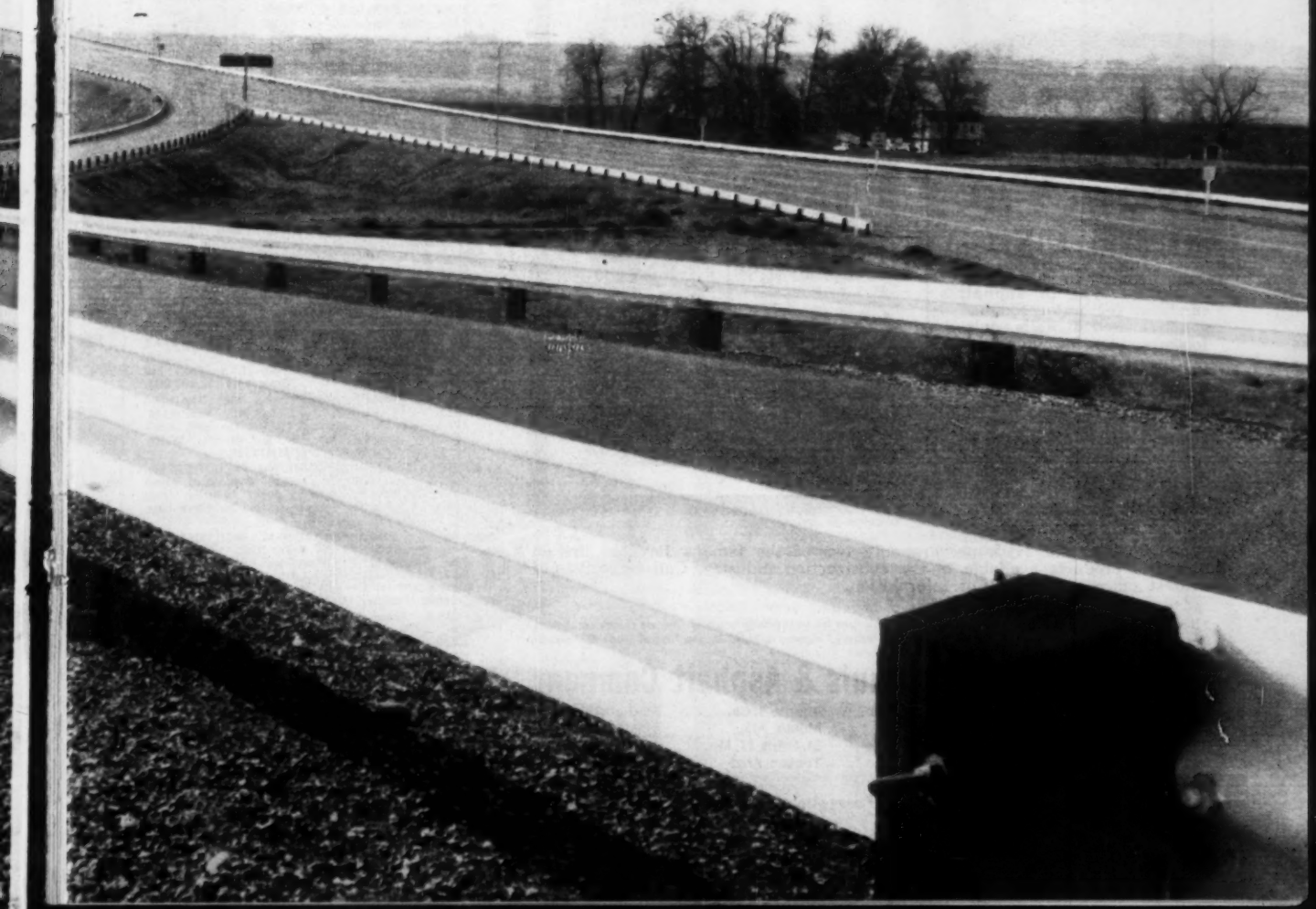
This experience on the Washington State Highways verifies the results being obtained in other parts of the country. Pressure-creosoted posts make your tax dollars go further.

Note: U. S. Steel does not make pressure-creosoted posts but supplies much of the creosote used by the wood-treating industry. For more information write United States Steel, 525 William Penn Place, Pittsburgh 30, Pa. *USS is a registered trademark*

Creosote's Past Assures Wood's Future

USS **Creosote**

Sales Offices: Pittsburgh, New York, Chicago, Salt Lake City and Fairfield, Alabama



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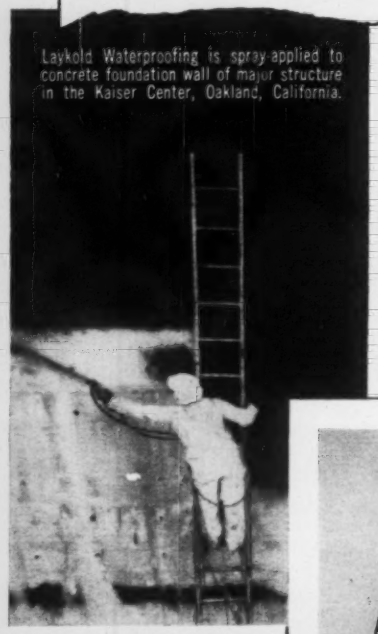

Laykold Waterproofing is spray applied to concrete foundation wall of major structure in the Kaiser Center, Oakland, California.

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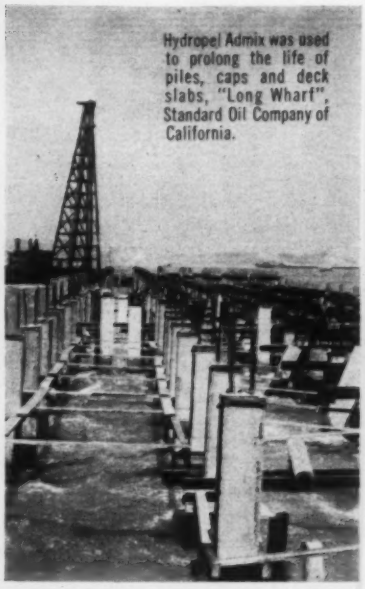
for fast, economical "first-line" protection. Laykold® Waterproofing* is a specially-compounded asphalt emulsion for cold, external application on concrete or masonry walls. Put on by brush or spray ahead of backfills, it provides resistance to moisture and dampness.



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a unique type of asphalt emulsion for waterproofing* concrete used in walls, slabs, footings, etc. for industrial, marine or other construction.

Whenever moist conditions, freeze-thaw cycles, the presence of alkaline or neutral salts require the absolute minimum of moisture absorption, always specify Hydropel®. It cuts capillary water absorption by 80 per cent.

Waterproofing and Hydropel are only two of the famous Laykold line of asphaltic products available to the construction industry. Call or write our nearest office today for full information.

*The limitations of any product to "waterproof" any type of surface for an indefinite length of time are clearly recognized, as covered by the "Trade Practice Rules for the Masonry Industry," outlined 8/31/46 by the Federal Trade Commission.

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BITUMULS Emulsified Asphalts • CHEVRON Paving Asphalts • LAYKOLD Asphalt Specialties

(Continued from page 87)

troop housing and utilities, Dow Air Force Base. $2,404,000. CD 9/17.

▲† **Me., Brunswick**—OPERATIONAL FACILITIES, etc.—Dist. P. Wks. Office, 495 Summer St., Boston, Mass., operational and training, maintenance, supply, administrative and community facilities, troop housing and utilities, Naval Air Station. $11,417,000. CD 10/6/53.

▲† **Me., Limestone**—OPERATIONAL FACILITIES—U. S. Eng., 150 Causeway St., Boston, Mass., operational and training facilities and utilities, Loring Air Force Base. $3,774,000. CD 9/17.

▲† **Md., Andrews Air Force Base** — OPERATIONAL FACILITIES, etc.—U. S. Eng., First and Douglas Sts. N. W., Wash. 25, D. C., operational and training, maintenance, supply and administrative facilities and utilities, Camp Springs. $18,937,000. CD 10/3/51.

▲† **Mass., Falmouth**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 150 Causeway St., Boston, operational and training and maintenance, troop housing and utilities, Otis Air Force Base. $3,689,000. CD 3/12.

▲† **Mich., Marquette**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 1101 Washington Blvd., Detroit, operational and training, and maintenance, supply, hospital, administrative facilities, troop housing and utilities, K. I. Sawyer Municipal Airport. $10,673,000. CD 3/12.

▲† **Mich., Oscoda**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 600 E. Jefferson St., Detroit, operational and training, maintenance, supply, hospital and community facilities and utilities, Wurtsmith Air Force Base. $8,696,000. CD 3/12.

▲† **Mich., Selfridge Air Force Base**—OPERATIONAL FACILITIES—U. S. Eng., 600 E. Jefferson Ave., Detroit, Mich., operational and training, maintenance and utilities and ground imprvs. $3,579,000. CD 3/12.

▲† **Minn., Duluth**—MAINTENANCE FACILITIES, etc.—U. S. Eng., 1217 U. S. Post Office & Custom House, St. Paul, maintenance facilities, troop housing, real estate and utilities, Duluth Municipal Airport. $2,649,000. CD 3/20.

▲† **Miss., Meridian**—OPERATIONAL FACILITIES, etc.—Dpt. P. Wks., Sixth Naval Dist., Bldg. No. 13, U. S. Naval Base, Charleston, S. C., operational and training facilities, maintenance, supply and medical facilities, troop housing, community facilities and utilities and ground imprvs. Naval Auxiliary Air Station. $14,940,000. CD 11/29/56.

▲† **Mo., Grandview**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 1800 Federal Office Bldg., 911 Walnut, Kansas City 6, Mo., operational and training, maintenance, supply, administrative facilities, Richards-Gebaur Air Force Base. $2,799,000.

▲† **Mo., Knob Noster**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo., operational and training and supply facilities, utilities and real estate, Whiteman Air Force Base. $5,185,000.

▲† **Mont., Glasgow**—OPERATIONAL AND TRAINING FACILITIES—U. S. Eng., City-County Airport, Walla Walla, Wash., operational and training maintenance supply and hospital facilities community facilities, utilities, Glasgow Air Force Base, $10,659,000. CD 3/12.

▲† **Neb., Fort Crook**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 1709 Jackson St., Omaha, operational and training facilities, supply facilities, Offutt Air Force Base. $3,265,000. CD 9/19/57.

▲† **Neb., Lincoln** — OPERATIONAL AND TRAINING FACILITIES—U. S. Eng., 1709 Jackson St., Omaha, Zone 2, operational and training, maintenance and supply facilities and utilities, Lincoln Air Force Base. $4,250,000. CD 8/23/56.

▲† **N. J., Wrightstown**—OPERATIONAL and TRAINING FACILITIES, etc.—U. S. Eng., 2655 Abbottsford Rd., Phila., Pa., operational, training and maintenance facilities, troop housing, and utilities, McGuire Air Force Base. $3,901,000. CD 3/12.

▲† **N. M., Albuquerque**—HOUSING—U. S. Eng., Box 1538, 213 units of housing, Bardia Base. $2,100,000.

▲† **N. M., Roswell**—OPERATIONAL AND TRAINING FACILITIES, etc.—U. S. Eng., P.O. Box 1538, Albuquerque, operational and training facilities, supply facilities, community facilities, and utilities, Walker Air Force Base. $8,431,000. CD 12/20.

▲† **N. C., Goldsboro**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 308 Customhouse, Wilmington, operational and training facilities supply facilities, troop housing and utilities, Seymour-Johnson Air Force Base, $4,707,000. CD 9/17.

▲† **N. C., Hertford**—OPERATIONAL FACILITIES, etc.—P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va., operational and training maintenance, medical and administrative facilities, troop housing and utilities and ground improvements, Naval Seaplane Facility, Harvey Point, $11,215,000.

▲† **N. D., Grand Forks**—AIR BASE IMPRVS.—U. S. Eng., 1709 Jackson St., Omaha, Neb., maintenance supply and hospital facilities, troop housing, community facilities and utilities, Grand Forks Air Force Base. $4,176,000.

▲† **N. D., Minot**—AIR FORCE BASE IMPRVS.—U. S. Eng., 1709 Jackson St., Omaha, Neb., maintenance, supply administrative, troop housing facilities, community facilities and utilities, Minot Air Force Base, $2,721,000. CD 8/20/56.

▲† **Okla., Altus**—OPERATIONAL FACILITIES, etc.—U. S. Eng., Box 61, Tulsa, Zone 2, operational and training facilities, supply facilities, utilities and real estate, Altus Air Force Base, $4,051,000. CD 9/17/51.

▲† **Okla., Clinton**—OPERATIONAL FACILITIES, etc.—Officer in Charge Constr., Eighth Naval Dist., Bldg. 16, U. S. Naval Station, New Orleans (Algiers) operational and training, supply community facilities and utilities Clinton-Sherman Air Force Base, $2,734,000.

▲† **Okla., Oklahoma City**—AIR BASE FACILITIES—U. S. Eng., P. O. Box 61, Tulsa, Okla., operational and training maintenance, and community facilities, troop housing, Tinker Air Force Base, $5,196,000.

▲† **Pa., Middletown**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 24th St. and Maryland Ave., Baltimore, Md., operational and training, maintenance, medical, administrative and community facilities, troop housing, utilities and real estate, Olmsted Air Force Base. $6,169,000.

▲† **S. C., Beaufort**—OPERATIONAL FACILITIES, etc.—P. Wks. Office, Dpt. Navy, Naval Base, Charleston, operational and training facilities, Marine Corps Auxiliary Air Station. $4,352,000. CD 8/28/56.

▲ **S. D., Rapid City**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 1709 Jackson St., Omaha, Neb., operational and training maintenance and community facilities, and utilities, Ellsworth Air Force Base. $2,931,000. CD 9/17/57.

▲† **Tex., Big Spring**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 100 W. Vickery St., Fort Worth, operational and training and maintenance facilities, utilities and ground imprvs. and real estate, Webb Air Force Base. $3,081,000. CD 9/17.

▲† **Tex., El Paso**—OPERATIONAL FACILITIES, etc.—U. S. Eng., Box 1229, Galveston, operational and training and supply facilities, troop housing and utilities, Biggs Air Force Base. $5,080,000.

▲† **Tex., Fort Worth**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 1100 W. Vickery St., Fort Worth, operational, training and supply facilities, Carswell Air Force Base. $2,257,000. CD 9/17.

▲† **Tex., San Antonio**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 606 Santa Fe Bldg., Galveston, operational and training, research, development and test facilities, supply, hospital, medical, administrative and community facilities, troop housing, utilities and ground imprvs., School of Aviation Medicine, Brooks Air Force Base. $12,000,000. CD 4/30/52.

▲† **Tex., Wichita Falls**—OPERATIONAL FACILITIES, etc.—U. S. Eng., Box 1600, Fort Worth, operational and training, maintenance and community facilities, troop housing and utilities, Sheppard Air Force Base. $2,051,000. CD 9/19.

▲† **Wash., Moses Lake**—OPERATIONAL AND TRAINING FACILITIES, etc.—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, operational, training, maintenance and supply facilities, and utilities, Larson Air Force Base. $3,795,000. CD 9/16/57.

▲† **Wash., Spokane**—OPERATIONAL AND TRAINING FACILITIES, etc.—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, operational and training facilities, and utilities, Fairchild Air Force Base, $4,094,000. CD 4/24.

▲† **Wis., Kansasville**—OPERATIONAL AND TRAINING FACILITIES, etc.—U. S. Eng., 475 Merchandise Mart, Chicago 54, Ill., operational and training, maintenance, supply, hospital and community facilities, troop housing, Richard Bong Air Force Base, $15,552,000.

PUERTO RICO

▲† **Puerto Rico, Roosevelt Roads**—OPERATIONAL FACILITIES, etc.—P. Wks. Office, Caribbean Naval Station, San Juan, P. R., operational and training facilities, Naval Station. $3,824,000.

PUBLIC BUILDINGS

▲† **Ala., Huntsville**—ADMINISTRATIVE FACILITIES, etc.—U. S. Eng., 2201 Grant St., Mobile, administrative, troop housing facilities and utilities, Redstone Arsenal. $8,529,000. CD 2/4.

▲† **Calif., Camp Pendleton**—HOUSING—Eleventh Naval Dist., 1220 Pacific Hy., San Diego, 1,562 units housing, Marine Corps Base. $15,000,000.

▲† **Calif., Camp Pendleton**—OPERATIONAL FACILITIES, etc.—Eleventh Naval Dist., 1220 Pacific Hy., San Diego, operational and training and maintenance, troop housing and utilities, Marine Corps Base. $5,138,000.

▲† **Calif., Fort Ord**—OPERATIONAL FACILITIES, etc.—U. S. Eng., 180 New Montgomery St., San Francisco, operational and training, maintenance and supply facilities, troop housing, community facilities and utilities. $4,733,000. CD 9/18.

▲† **Calif., San Diego**—OPERATIONAL FACILITIES, etc.—Dpt. P. Wks., Eleventh Naval Dist., 1220 Pacific Hy., San Diego, operational and training facilities, Naval Training Center. $4,199,000. CD 9/23.

▲ **Calif., Vallejo**—SCHOOLS—Vallejo City Unif. School Dist., c/o supt., 111 Idaho St., defeated $4,333,000 bonds June 3, elementary school, Junior High School and existing schools addns. CD 3/11.

▲† **Fla., Green Cove Springs**—HOUSING—P. Wks. Office, 6th Naval Dist., U. S. Naval Base, Charleston, S. C., 392 units of housing, Naval Station. $3,000,000.

▲† **Ga., Fort Benning**—HOUSING etc.—U. S. Eng., 200 E. St. Julian St., Savannah, operational and training, maintenance facilities, troop and family housing. $3,454,000. CD 9/19/55.

▲† **Idaho, Arco**—WASTE STORAGE, etc.—Atomic Energy Comn., Idaho Operations Office, Idaho Falls, waste storage installation, Proj. 59-a-4, $3,200,000; army reactor experimental area (AREA) Proj. 59-d-4, $1,000,000. CD 4/12/56.

▲ **Ill., Carbondale**—PHYSICAL EDUC. AND MILITARY TRAINING—State Dpt. Educ., Springfield, plans by Perkins & Will, 309 W. Jackson Blvd., Chicago, Zone 6, 2 story, rein.-con., brick, structural steel, physical educ. and military training bldg. $3,500,000. CD 4/9/45.

▲ **Ill., Rockford**—NURSING HOME—Winnebago County Bd., Courthouse Bldg., referendum Nov. 4, River Bluff Nursing Home wing, $2,170,000, Bradley & Bradley, 924 N. Main St., archts.

▲† **Me., Brunswick**—HOUSING—Dist. P. Wks. Office, First Naval Dist., 495 Summer St., Boston, Mass., 277 units of housing, Naval Air Station. $2,770,000. CD 1/25/55.

▲† **Md., Annapolis**—TROOP HOUSING—P. Wks. Office, U. S. Naval Academy, Annapolis, troop housing, Naval Academy. $14,200,000. CD 11/17/47.

▲† **Md., Bethesda**—HOSPITAL, etc.—Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., hospital and medical facilities, National Naval Medical Center. $8,503,000. CD 5/20.

▲† **Md., Edgewood**—HOUSING, etc.—U. S. Eng., 24th St. and Maryland Ave., Baltimore, Zone 18, troop housing and utilities for Army Chemical Center. $2,051,000. CD 8/31/56.

▲† **Mo., Fort Leonard Wood**—HOUSING—U. S. Eng., Federal Office Bldg., Kansas City, Mo., 700 units of housing. $7,000,000. CD 9/17.

▲ **Mo., Moberly**—MEDIUM SECURITY PRISON, etc.—Missouri Bd. P. Bldgs., 100 State Capitol, Jefferson City, plans by Marcel Boulicault, 411 N. 7 St., St. Louis 1, Mo., and Curtin & Davis, consult. archts., 2475 Canal St., New Orleans 12, La., medium security prison, etc. $8,000,000 constr., $2,000,000 for equip. CD 11/25. Bids about Apr. 1, 1959.

▲† **Mo., St. Louis County**—RECORDS CENTER—General Services Admin., P. Bldgs. Service, 19 and F Sts. N.W., Wash. 25, D. C., 1 story, 488,000 sq. ft. records center with air-conditioned offices. $6,572,000. CD 10/11/56, under Mo., St. Louis.

▲† **Pa., Carlisle**—HOSPITAL—U. S. Eng., 2365 Abbotsford Rd., Phila., hospital facilities, family housing, Carlisle Barracks. $2,272,000.

▲† **Pa., Oakdale**—POWER GENERATOR BLDG., etc.—U. S. Eng., 925 New Federal Bldg., Pittsburgh, 1 story, 5,760 sq. ft. concrete masonry Consolidated Power Generator Building, 1 story, 35,170 sq. ft. rein.-con. AAOC bldg., 1 story, 1,467 sq. ft., concrete masonry Squadron Headquarters Bldg., 1 story,

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6,488 sq. ft. concrete masonry Operation bldg., 4 steel radar towers, sewage disposal facilities and outside utilities for entire site. $2,000,000-$5,000,000. Bids about November.

▲† Tenn., Oak Ridge—FABRICATION PLANT, etc.—Atomic Energy Comn., 1901 Constitution Ave. N.W., Wash. 25, D. C., fabrication plant, Proj. 59-b-3, $12,500,000. CD 9/7; metals and ceramics research bldg. Proj. 59-d-15, $6,500,000; central research laboratory addn., Proj. 59-e-5, $3,500,000; cyclotron, Proj. 59-3-14, $3,000,000; reprocessing pilot plant, Proj. 59-d-1, $3,500,000, for Oak Ridge National Laboratory.

▲† Tex., El Paso—HOUSING—U. S. Eng., Box 1538, Albuquerque, N. M., 410 units of housing, Fort Bliss, $4,000,000. CD 4/25/56.

▲† Tex., El Paso—OPERATIONAL FACILITIES, etc.—U. S. Eng., Box 1538, Albuquerque, N. M., operational, training and maintenance facilities, troop housing and utilities, Fort Bliss, $13,734,000.

▲† Tex., Fort Hood—OPERATIONAL FACILITIES, etc.—U. S. Eng., Box 1229, Galveston, operational, training, maintenance, supply and administrative facilities, troop housing and utilities. $4,258,000.

▲ Tex., San Antonio—SHOPPING CENTER, etc.—S. E. & G. S. McCreless, 1130 Fair St., plans by Phillip Lloyd Shoop, proj. archt., 122 W. Olmos Dr., regional shopping center $10,000,000; 5,000 auto parking center $150,000; area lighting sys. $75,000; site earthwork $50,000, water sys. incl. pump house $45,000, all on 63 acre tract in Highland Park Area. CD 8/29.

▲† Va., Fort Eustis—OPERATIONAL FACILITIES, etc.—U. S. Eng. Commanding Officer, Fort Eustis, operational and training, administrative facilities, troop housing and utilities. $3,634,000.

▲† Va., Fort Lee—OPERATIONAL FACILITIES, etc.—U. S. Eng., foot of Front St., Norfolk, operational and training facilities and troop housing. $4,630,000. CD 9/18.

▲† Va., Fort Lee—HOUSING—U. S. Eng., foot of Front St., Norfolk, 435 units of housing. $4,000,000.

▲† Va., Norfolk—OPERATIONAL FACILITIES, etc.—P. Wks. Office, Fifth Naval Dist., U. S. Naval Station, operational and training facilities, Naval Base. $2,546,000.

▲† Va., Norfolk—OPERATIONAL FACILITIES, etc.—P. Wks. Office, Fifth Naval Dist., U. S. Naval Station, Norfolk, operational and training facilities, Armed Forces Staff College. $4,643,000.

▲† Wash., Richland—PRODUCTION REACTOR, etc.—Atomic Energy Comn., 1901 Constitution Ave. N.W., Wash. 25, D. C., production reactor for special nuclear materials, convertible type, Proj. 59-a-5, $145,000,000; component fabrication plant, 59-b-2, $3,500,000; school storage bldgs., Proj. 59-h-1, $75,000. CD 6/30/52.

▲ Wis., Madison—STATE OFFICE—State of Wisconsin, Madison, plans by Grassold, Johnson & Assocs., 734 N. Jefferson St., Milwaukee, Zone 2, 8 story, 81x459 ft. and 2 story, 80x256 ft. state office bldgs. $4,223,000. R. C. Kirckhoff, c/o owner, state archt. CD 8/15.

▲ Ont., Toronto—ADMINISTRATION—Bd. Educ., 155 College St., plans by Page & Steel, 72 S. Clair Ave. W., 7 story, bsmnt., 89x270 ft. administration bldg., 159-165 College St. $3,500,000. M. S. Yolles & Assoc., 111 Richmond St. W., consult. engrs. CD 11/15/56.

COMMERCIAL BUILDINGS

▲ Alaska, Anchorage—HOTEL—Alaska Hotel & Investment Co., c/o Gene's Realty, Anchorage, hotel. $6,500,000.

▲ Fla., Boynton Beach—RESIDENCES—R. J. Lynch Inc., 411 Corliate St., plans by Rude, Hostettler & Taylor, 1325 NE 4th Ave., Fort Lauderdale, 500 residences, Delray Beach. $7,000,000.

▲ Ill., Rockford—COLLEGE—Rockford College, plans by Perkins & Will, 309 W. Jackson Blvd., Chicago, Zone 6, college bldgs., Hy. 20 and Alpine Rd. $9,000,000. Constr. 1958-1961.

▲ N. J., Paramus — DEPARTMENT STORE — Gimbel Bros., 31 St. and Broadway, New York, N. Y., 3 story, 240,000 sq. ft. department store, Garden State Plaza, Rtes. 4 and 17. $5,000,000.

▲ N. J., Trenton—STATE FAIR SHOPPING CENTER—Owner, c/o Feist & Feist, 58 Park Place, Newark, plans by William E. Lehman, 972 Broad St., Newark, State Fair Shopping Center, Trenton Fair Grounds, Hamilton Twp. $7,500,000.

▲ N. Y., Westbury—HOTEL—Raceway Properties, Roosevelt Raceway, Westbury, plans by Carlos R. Schoeppl, 2944 Biscayne Blvd., Miami, Fla., and Karl Frese, 1340 N. E. 2nd St., Miami, Fla., 1 and 2 story hotel, Old County Rd. at Zeckendroff Blvd. $3,000,000.

▲ N. M., Albuquerque—OFFICE—Bank of New Mexico, 3022 Central Ave. S.E., Albuquerque, N. M., and Trammel Crow, 425 S. Field St., Dallas, Tex., plans by Harold Berry, 4626 Ross Ave., Dallas, Tex., 14 story office bldg., corner of Fourth St. and Gold Ave. $14,000,000. CD 9/23/57.

▲ O., Hilliard—HOMES AND SHOPPING CENTER—Colonial Homes, Inc., Ashland, c/o Marvin Yerke, 40 W. Broad St., Columbus, 500 homes, on 147 acre site south of Scioto-Darby Creek Rd. and west of Rome-Hilliard Rd., $6,000,000; shopping center on 19 acre south of Scioto-Darby Creek Rd. and west of Rome-Hilliard Rd. $1,500,000.

▲ Pa., Phila.—DORMITORIES—Temple University, 1900 Park Ave., plans by Nolen & Swinburne, 1601 Locust St., men's dormitories, $2,787,000. CD 2/7/45.

INDUSTRIAL BUILDINGS

▲ Md., Dickerson — GENERATOR — Potomac Electric Power Co., 929 E St. N.W., Wash. 4, D. C., 175,000 kw turbine-generator unit, boiler and auxiliaries for Second Unit Power Plant. $25,000,000.

UNCLASSIFIED

▲† Calif., Long Beach—OPERATIONAL FACILITIES—Dpt. P. Wks., Eleventh Naval Dist., 1220 Pacific Hy., San Diego, operational and training facilities, Naval Shipyard. $6,000,000. CD 9/18.

▲ Calif., Los Angeles—PASSENGER CARGO TERMINAL, etc.—Los Angeles City Bd. Harbor Comrs., 1300 City Hall, plans by Kistner, Wright & Wright, 1125 W. 6th St., Edward H. Fickett, 7421 Beverly Blvd., and S. B. Barnes & Assocs., 2263 Beverly Blvd., Los Angeles, 2 story, 1,000 x 200 ft. clear span passenger cargo terminal and 630 x 200 ft. cargo bldg., wharf, dockside rail and truck facilities, tanks and refrigeration and dredging. $8,000,000-$10,000,000. Bids in May. CD 12/14/56.

▲† Conn., New London—SUBMARINE BASE FACILITIES—Dist. P. Wks. Office, 3rd Naval Dist., 90 Church St., New York, N. Y., operational and training facilities, Naval Submarine Base. $2,247,000. CD 9/18/57.

▲† Me., Jonesport—OPERATIONAL FACILITIES, etc.—Dist. P. Wks. Office, First Naval Dist., 495 Summer St., Boston, Mass., operational and training facilities, utilities and ground imprvs., Naval Radio Station. $38,654,000. CD 9/18.

▲ Missouri—GAS DISTRIBUTION FACILITIES—Central Missouri Gas Co., Kirksville, natural gas distr. facilities for Kirksville, Lancaster, Greentop and Queen City and connection with Michigan-Wisconsin Pipe Line Co. trunk line, near here. Over $2,000,000.

▲† N. M., Los Alamos—PHERMEX INSTALLATION, etc.—Atomic Energy Comn., Los Alamos, phermex installation, Proj. 59-c-5, $2,250,000; laboratory bldg., TA-33, Proj. 59-c-6, $590,000.

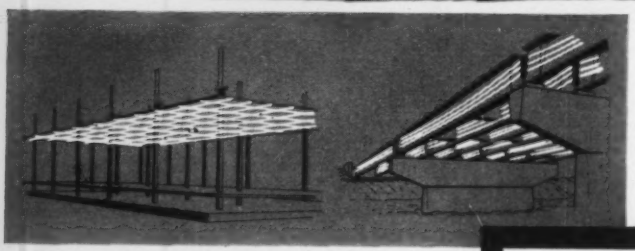
▲ N. Y., New York—PIER—Dpt. Marine & Aviation, Pier A, North River, New York, Zone 4, Pier 94, North River, foot of 54th St. to be used by Cunard Steamship Co. Ltd. Project D-87. $5,500,000. Praeger, Kavanaugh & Waterbury, 126 E. 38th St., Zone 16, engrs. Constr. 1959.

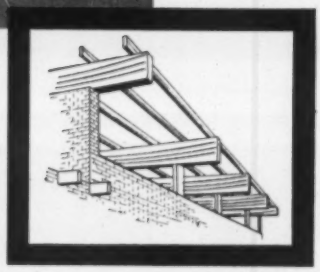
▲† Okla., Fort Sill—TRANING CENTER FACILITIES—U. S. Eng., Box 61, Tulsa, operational, training, maintenance and administrative facilities and utilities. $3,227,000.

▲† R. I., Newport—UTILITIES—First Naval Dist., 150 Causeway St., Boston 14, Mass., utilities, Naval Supply Depot. $2,210,000. CD 9/17.

▲† Tenn., Knoxville—SUB-STATION—Tennessee Valley Auth. New Sprankle Bldg., 150,000 kva sub-station, $2,000,000.

PATTERNS OF TOMORROW TODAY





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NEW ENGLAND

HEAVY CONSTRUCTION—BA

▲† **Vermont**—BA 10/9—U. S. Eng., 150 Causeway St., Boston, Mass., Townsend Dam and Reservoir, West River, ENG-19-016-59-7. $6,000,000. Plans deposit $50. Extended date. CD 8/27.

BUILDINGS—BA

▲ **Mass., Bridgewater**—DORMITORY, etc.—BA 10/10—Commonwealth of Mass., Dpt. Education, c/o Div. Bldg. Constr., 38 Chauncy St., Boston, E-58-1, dormitory and imprvs., State Teachers College. $1,075,000. Plans deposit $100. Richmond & Goldberg, 15 Arlington St., Boston, archts. CD 2/6.

HEAVY CONSTRUCTION—LB & CA

▲ **MAINE**—State Hy. Comn., State Office Bldg., Augusta,
Warren Brothers & W. H. Hinman, North Anson, Me., CA **$1,064,197**, b. conc. 19.006 mi. FAP DF-01-5 (3), Macwahoc. Bids Aug. 13. CD 8/20, under LB.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, Bids opened 9/16,
Berke Moore Co., Inc., 8 Newbury St., Boston, Mass., LB **$4,966,341**, est. $5,480,507, hy. reconstr. Rte. 28-Riverside Ave. to Roosevelt Circle. FA Proj. I-93 1(10) 2 Section A, Medford. Bids Sept. 16. CD 9/3.

▲ **Salah & Pecci Constr. Co., Inc.**, 233 Harvard St., Brookline, Mass., CA **$1,312,415**, est. $1,250,000, Contr. No. 1103, beach imprvs. Phase 2, seawall, bastions, etc., Quincy, MASSACHUSETTS. Commonwealth of Mass., Metropolitan Dist. Comn. Parks, Dpt., 20 Somerset St., Boston, Mass. Bids Sept. 10. CD 9/5, under LB.

▲ **Perini Corp.**, 73 Montwalt Ave., Framingham, Mass., CA **$2,373,642**, est. $2,300,000, Contr. No. 270, constr. caisson for pumping station-Deer Island Sewage Treatment Plant, BOSTON, MASS. Commonwealth of Mass., Metropolitan Sewer Comn., Constr. Div. 20 Somerset St., Boston, Mass. Bids Aug. 14. CD 8/18, under LB.

▲ **RHODE ISLAND**—State R. I. & Prov. Plants, Div. Purchase, State House, Providence, Bids opened 9/11,
R. I.—**M. A. Gammino Constr. Co.**, 728 Balley St., Providence, R. I., LB **$615,954**, est. approx. $600,000, pavement, Centerville Rd. R. I. Bid 229 RI Contr. 5807 FA Proj. S-0260 (1) Warwick and West Warwick;
R. I.—**A. Forte & Sons, Inc.**, 14 Whipple St., Cumberland, R. I. LB **$553,992**, est. approx. $570,000, pavement River Rd. and Old River Rd. Bid 230 R. I. Contr. 5811 F.A. Proj. S-0207 (2) Lincoln;
R. I.—**Campanella & Cardi Constr. Co.**, 780 Jefferson Blvd., Warwick, R. I. LB **$425,806**, est. approx. $500,000, Bid 231 Contr. 5824, F.A. Proj. DS-0315 (1) pavement Jefferson Blvd. and Kenyon Ave., Warwick. CD 9/5.

▲ **CONNECTICUT**—State Hy. Dpt., State Office Bldg., Hartford,
Enfield Rd. Constr. Co., Inc., Depot Hill Warehouse Point, Conn. and **E. T. O'Neill & Son Constr. Corp.**, 223 Commercial St., Holyoke, Mass. LB **$3,683,357** (7 bidders) Proj. 48-88 Enfield Conn., grading, drainage, lighting, traffic controls and c. conc. pavement 24,000 lin. ft. Hartford-Springfield Expressway, incl. 6 grade separation structures, FAI Proj. 1-139 (24). Bids Sept. 15, CD 8/26.

BUILDINGS—LB & CA

▲† **S. Volpe & Co., Inc.**, 185 Devonshire St., Boston, Mass., CA Est. **$1,000,000**, 36,000 sq. ft. special cantilever hangar, Hartwell Rd., BEDFORD, MASS., for Raytheon Mfg. Co., Waltham, Mass. First Naval Dist., 495 Summer St., Boston, Mass. Fay, Spofford & Thorndike, 11 Beacon St., Boston, Mass., engrs. Bids June 2. CD 6/10, under Industrial Bldgs., Raytheon Mfg. Co., as owner.

▲ **Brick & Concrete Constr. Corp.**, 501 High St., Dedham, Mass., LB **$1,129,800**, est. $1,000,000, JUNIOR HIGH SCHOOL, HINGHAM, MASS. Town Junior High School Bldg. Comn., 220 Central St., Hingham, Mass. Bids Sept. 11. CD 8/13.

E. Turgeon Constr. Co., Inc., 52 Weybosset St., Providence, R. I. CA **$819,011**, HOSPITAL, 22 Wampanaug Ave., EAST PROVIDENCE, R. I. Hattie Ide Chaffee Memorial Hospital, 891 Broadway, East Providence, R. I. Bids Aug. 28. CD 9/3, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

September 30 Maryland

STREETS AND ROADS

September 30 Maryland October 6 Pennsylvania
October 7 New Jersey

BUILDINGS—BA

▲ **Pa., Phila.**—NURSES RESIDENCE—BA 10/7—University of Pennsylvania, 3025 Walnut St., nurses residence, $1,000,000. Schmidt, Garden & Erikson, 104 S. Michigan Ave., Chicago, Ill., archts.-engrs. CD 7/11/52.

▲ **N. Y., New York**—SCHOOL—BA 10/3—Bd. Educ. City of New York, Bureau Constr., 42-15 Crescent St., Long Island City, general constr., plumbing and drainage, heating and ventilating and electrical work and lighting fixtures for modernization and conversion of Junior High School 99, 1st Ave. and E. 100th St., Manhattan Boro. Plans deposit $25 for general, $10 each for trades. Extended date. CD 9/12.

▲ **N. Y., New York**—SCHOOL—BA 10/21—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, Zone 1, general constr., plumbing and drainage, heating and ventilating, electrical work and lighting fixtures, Junior High School 136, Prospect Ave., Ritter Place, Union Ave. and Jennings St., Bronx Boro. $3,538,000. Plans deposit $35 for general, $10 each for trades. CD 7/23.

BUILDINGS—SLC

▲ **N. J., Eatontown**—SHOPPING CENTER—Massachusetts Mutual Life Insurance Co., 1295 State St., Springfield, Mass., soon lets contract 240,000 sq. ft. Monmouth Shopping Center, Traffic Circle. $3,000,000. Kahn & Jacobs, 2 Park Ave., New York, N. Y., and Abbott Merkt & Co., 10 E. 40 St., New York, N. Y., engrs.-archts. CD 3/13/56.

HEAVY CONSTRUCTION—LB & CA

▲ **Chicago Bridge & Iron Co.**, 332 S. Michigan, Chicago, Ill. LB **$11,097,000** (2 bidders), 13 penstocks at Niagara Power Proj., NP-22, NEW YORK. Power Authority of State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, N. Y. CD 8/15.

▲ **Okonite Co.**, Passaic St., Passaic, N. J., CA **$1,864,756**, furnishing, dely. high pressure oil pipe type cable for Niagara Power Proj. in Lewiston, Niagara Co. Contr. NP 13 Spec. No. PA-N-25021, NEW YORK. Power Authority of State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, N. Y. Bids Aug. 28. CD 8/29, under LB.

▲ **NEW JERSEY**—State Hy. Dpt., Kenneth D. Rice, secy., 1035 Parkway Ave., Trenton,
Ell-Dorer Contg. Co., 644 Nye Ave., Irvington, N. J. CA **$1,038,888**, Rte. 101 bridge over Delaware, Lackawanna & Western R.R. and incidental paving, Morris Co. Bids July 29. CD 8/1, under LB.

▲ **Bechtel Corp.**, 612 S. Flower St., Los Angeles, Calif., CA **$1,500,000**, gas line from northern end of Trenton into Princeton Twp., Mercer, Bergan, Hudson and Passaic Counties, NEW JERSEY, Transcontinental Gas Pipe Line Corp., 744 Broad St., Newark, N. J.;
United Excavating Corp., 634 St. George St., Linden, N. J., CA **$250,000**, excavating and fill, gas line near Kearny, (New Jersey).

▲ **PENNSYLVANIA**—Pa. Hy. & Bridge Auth., 506 North Office Bldg., Harrisburg,
State Paving & Constr. Co., 69th and Kingsessin Ave., Phila. 42, Pa. CA **$1,287,744**, 24,594 ft. c. conc. road variable in width, between Newtown Square and Highland Park, T.R. 3, Newtown Marple, Haverford, and Upper Darby Twps., Delaware Co. Bids July 25. CD 7/29, under LB.

BUILDINGS—LB & CA

▲ **Krueger Bros.**, 270 Monroe Ave., Kenilworth, N. J., Own Forces, **$3,000,000**, 100 HOUSES, utilities, Mount Airy and Lake Rds., Bernards Twp., BASKING RIDGE, N. J., Harry Pfaff, Oak St., Fanwood, N. J., engr. Walter Pfeiffer, 109 Washington St., Morristown, N. J., archt.

▲ **Joseph Karp**, c/o Brounell & Kramer, 1478 Morris Ave., Union, N. J., Own Forces, **$1,800,000**, 104 HOUSES, Tenneyson Ave., CARTERET, N. J.

▲ **Massett Bldg. Co.**, 212 N. Georgia Ave., Atlantic City, N. J., CA **$3,000,000**, OFFICE BLDG. and parking area, LINWOOD, N. J. Prudential Life Insurance Co. of America, 763 Broad St., Newark, N. J. Bids Aug. 22, CD 9/5, under LB.

▲ **Martin Levin & Alan Sagner**, Crescent Circle, South Orange, N. J., Own Forces, **$6,000,000**, 220 HOUSES, Cherry Hill, off Mount Pleasant Ave., LIVINGSTON, N. J.

▲ **Durante & Lee**, c/o Rudolph Novak, archt., 89 Central Ave., Clifton, N. J., Owner Builds, **$1,400,000**, 55 HOUSES, Waldwick Lane and Lindburg Parkway, WALDWICK, N. J.

▲ **Morris Kadel & Morris Stein**, 1379 Hampbur Turnpike, Preakness, N. J., Owner Builds, **$1,600,000**, 76 HOUSES, 3rd section of Valley Rd. development, Wayne Park, WAYNE TWP., (Mountain View P. O.), N. J. C. J. Kordys, 116 Passaic St., Passaic, N. J., archt.

▲ **L. F. Driscoll Co.**, 32 W. Coulter St., Phila., Pa. LB **$1,630,000** NURSES HOME, PHILA., PA. Jefferson Hospital, 10th and Sansom Sts., Phila., Pa. Bids Sept. 9. CD 8/21.

▲ **John McShain**, 1501 N. Arlington Ridge Rd., Arlington, Va., LB **$3,329,000** (8 bidders) OFFICE BLDG., adjoining Embassy. British Embassy, Ministry of Wks., 3100 Massachusetts Ave., N. W., WASH., D. C. Eric Bedford, Ministry of P. Wks., London, England, archt. Bids Sept. 15. CD 8/29.

▲ **Catholic University**, 620 Michigan Ave. N. E., Wash., D. C., rejected bids July 2, SOCIAL CENTER and DORMITORY, WASH., D. C. LB **$1,738,000**. Will re-advertise. CD 7/7, under LB.

▲ **Capitol Development Co.**, c/o Howard Greenhouse, archt., 1009 Park Place, Wilmington, Del., Separate Contracts, **$1,500,000**, RESIDENTIAL DEVELOPMENT (110), NEWARK, DEL.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

October 1 Louisiana October 3 Kentucky

STREETS AND ROADS

October 1 Louisiana October 3 Kentucky

BUILDINGS—BA

▲ **Ky., Frankfort**—HEALTH SERVICE—BA 10/3—Commonwealth of Ky., Div. Purchases, Frankfort, substructure for 2 story, 120,000 sq. ft. brick, concrete health service bldg. $2,500,000. Plans deposit $35. Meriwether Marye & Assoc., 248 E. Short St. Lexington, Ky., archts. Southern Eng. Co., 323 W. Jefferson, Louisville, Zone 2, engr. CD 4/16.

▲ **N. C., Raleigh**—Y. M. C. A.—BA 10/15—Young Mens Christian Assn., Wyatt Taylor dir., 7 E. Edenton St. 90,000 sq. ft. Y. M. C. A. bldg., Hillsboro St., Over $1,000,000. Plans deposit $50. Leif Valand & Assoc., 2016 Cameron St., archts. CD 4/28/55.

HEAVY CONSTRUCTION—LB & CA

▲ **SOUTH CAROLINA**—State Hy. Dept., Hotel Jefferson, Columbia,
rejected bids Aug. 19, constr. base and b. conc. surf. 11.39 mi. 4 lane divided hy. Int. Rte. 85 from Pacolet River to Rte. 11. S.C. Dockets Nos. 11.344.1 & 42.464.1 F.A. Projs. No. I-85-3 (13) (I-301-2 (8)), Cherokee and Spartanburg Counties; LB **$2,465,213**; constr. hydraulic embankment 0.629 mi. US Rte. 17 begin approaches to proposed bridge over Ashley River, S.C. Docket No. 10.451 F.A. Proj. U-215 (2), Charleston Co. LB **$810,242**. CD 8/27, under LB.

▲ **ALABAMA**—State Hy. Dpt., H. L. Nelson, dir., Montgomery,
Herbert Constr. Co. Corp., 2208 8 Ave. S., Birmingham, Ala., CA **$3,016,980**, grade, drain 6.096 mi. from west of Fort Payne NE Int. Rte. 59, DeKalb Co. Bids July 25. CD 8/1, under LB.

▲ **Pittman Constr. Co.**, 2925 Franklin Ave. and Box 8116, New Orleans, La., CA **$1,279,000**, Wharf Unit No. 4 and Transit Shed No. 5, LAKE CHARLES, LA. City and Lake Charles Harbor & Terminal Dist., Lake Charles, La. Bids Aug. 28. CD 9/16, under LB.

▲ **KENTUCKY**—Commonwealth of Ky., Dpt. Hys., Frankfort,
Ruby Constr. Co. & Ruby Mining Co., 101 Sugg St., Madisonville, Ky., CA **$1,939,557**, grading, draining c. conc. with b. conc. on shoulders and incid. streets, etc. 0.57 mi. North South Expressway in Louisville from Woodbine St. extending northerly to St. Catherine St. I 65-6 (7), Jefferson Co. Bids Sept. 5. CD 9/12, under LB.

BUILDINGS—LB & CA

▲ **C. T. Wilson Constr. Co., Inc.**, 321 W. Geer St., Durham, N. C. CA **$1,024,643**, WARD BLDGS. renovation, BUTNER, N. C. N. C. Hospital Bd. Control, Capitol Bldg., Raleigh, N. C. CD 8/21, under LB.

▲ **Batson-Cook Co.**, P. O. Box 151 West Point, Ga., CA **$1,000,000** DEPARTMENT STORE addn., ATLANTA, GA. Rich's Inc., Forsyth St., Atlanta, Ga. Bids July 10. CD 8/4, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

September 30 Indiana October 14 Wisconsin & Minnesota

STREETS AND ROADS

September 30 Indiana

▲ **Ill., Chicago**—BA 9/30—Bd. Comrs. Cook Co., County Bldg., Zone 2, pave 1.8867 mi. East Lake Ave. from Waukegan Rd. to Laramie Ave., c. conc. base course widths to 42 ft., bit. bind. and surf. course, widening and curb and gutter work, $700,000, CD 1/23/58; c. conc. paving South Park Ave., Dixie Hy. to 159 St., 10 in. thick concrete 42 ft. wide comb. curb and gutter, rein.-con. bridge, 44 ft. roadway, 45 ft. span, prestressed superstructure, $1,400,000; furnish, install channelizing medians (mesh) at various locations, 163,434 lin. ft., 1 to 3 ft. wide, $950,000; pave 0.7769 mi. Wolf Rd., c. conc. base course, bit. surf. course, widen one section 20 to 7.4 ft. drain, structures, $170,000; removing 0.336 mi. Barrier Islands, incl. removing foundations (L structure) and bit. prisms, reconstr. ramps and street pavements and side slopes 5 to 72 ft. 205.58 ft., Kostner Ave. and Sacramento Blvd., $90,000; constr. tracks, signals communications facilities, electric work for relocation of transit facilities, earth work and drainage, $190,000. CD 9/9, under LB.

Ind., Indianapolis—BA 10/1—Indianapolis Water Co., 1220 Speedway Ave., Zone 7, (selected list of bidders), 102 x 142 ft. masonry, concrete, steel filter plant extension, $800,000. Fink, Roberts & Petrie, 563 W. Westfield Blvd., engrs. CD 11/25.

▲ **Ind., East Chicago**—BA 10/7—Bd. Sanitary Comn., 5200 Indianapolis Blvd., (A) sewage treatment plant, admin. bldg., sewage treatment plant addn. (B) 2 new pumping stations and 2 pumping station addns. (C) sanitary relief sewers and force main, $5,600,000. Consoer, Townsend Assocs., 351 E. Ohio St., Chicago, Ill., engrs. CD 12/13.

▲ **Ill., Chicago**—NATATORIUM—BA 10/8—City, City Hall, natatorium, Eckhart Park and Harrison Park,

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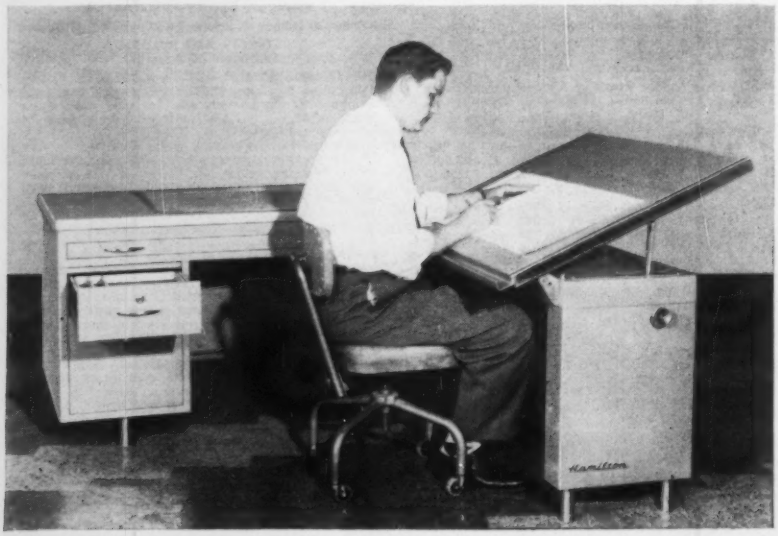


$1,000,000. Stanley Eng. Co., 208 S. LaSalle St., archt. CD 6/21/57.

BUILDINGS—BA

▲ **Ill., Chicago**—SCHOOL—BA 10/14—Bd. Educ., 228 N. LaSalle St., 2 story rein.-con., brick Medill School and alterations, 14 and Troop Sts. $1,090,000. Fugard, Burt Wilkinson & Orth, 520 N. Michigan Ave., Zone 11, archts. CD 8/1/57.

▲ **Ill., Chicago**—SCHOOL—BA 10/14—Bd. Educ., 228 N. LaSalle St., 2 story, rein-con. frame, brick school, 44 and Woodlawn Ave. $1,050,000. Raymond Peterson, 4014 W. Dempster, Skokie, archt. CD 5/26.

HEAVY CONSTRUCTION—LB & CA

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield. Bids opened Sept. 12,

Ill.—**Rock Road Constr. Co.**, 5915 Rodgers Ave., Chicago, Ill. LB $601,866 (8 bidders), wid'n. 4.14 mi. Rand Rd. between Arlington Hgts. and Des Plaines, Cook Co.; LB $119,723 (8 bidders) resurf. 4.15 mi. Rand Rd. between Arlington Hgts. and Des Plaines, Cook Co.;

Ill.—**Rein & Schultz, Inc.**, 119 E. Washington Ave., Madison, Wis., LB $527,847 (7 bidders), wid'n., resurf. 17.69 mi. U. S. 30 from U. S. 52 to Rock Falls, Whiteside and Lee Counties; LB $574,857 (8 bidders) wid'n., resurf. Ill. 47 from Forrest to Gibson City, Livingston and Ford Counties;

Ill.—**R. A. Cullinan & Son**, Tremont, Ill., LB $847,248 (2 bidders), wid'n., resurf. Ill. 116 from Milamora to Roanoke, Woodford Co.;

Ill.—**Champaign Asphalt Co.**, 310 E. Bradley, Champaign, Ill., LB $602,829 (2 bidders) wid'n., resurf. 10.08 mi. U. S. 136 from Rantoul to Ill. 49, Champaign and Vermillion Counties;

Ill.—**Chatham Paving Co.**, 8452 S. State St., Chicago, Ill. LB $1,259,385 (6 bidders) concrete base course and bridge 2.31 mi. over Addison Creek on Ill. 55, Cook Co.;

Ill.—**J. M. Corbett Co.**, 2500 S. Corbett St., Chicago, Ill. LB $743,332 (6 bidders) reconstr. 2.26 mi. Van Buren for frontage road on FAI-1, Cook Co.;

Ill.—**Danville Constr. Co.**, P. O. Box 223, Danville, Ill., LB $605,432 (3 bidders) wid'n. 13.44 mi. and resurf. 13.67 mi. U. S. 36 between Ill. 49 and Ill. 1, Douglas and Edwards Counties;

Ill.—**General Paving Co.**, 30 E. John St., Champaign, Ill. LB $500,597 (4 bidders) wid'n. 13.85 mi. U. S. 36 between La Place and Atwood, Pratt, Moultrie and Douglas Counties;

Ill.—**Gilmore Asphalt Prod.**, Anna, Ill. LB $611,262 (1 bidder) resurf. 6.55 mi., widening 4.86 mi. Ill. 3 and 146 from Jet to Cape Girardeau, Alexander and Union Counties;

Ill.—**Howell Asphalt Co.**, 1020 N. 13 St., Mattoon, Ill. LB $548,875 (5 bidders) wid'n., resurf. 16.96 mi. Ill. 130 between Newton and Liney, Jasper and Richland Counties;

Ill.—**Krug Excavating Co.**, 11835 Central Park, Blue Island, Ill., LB $733,166 (11 bidders) grading, retaining wall on Congress St. Expressway in Forest Park, Cook Co.;

Ill.—**Parro Constr. Co. & McMahan Illinois Corp.**, 604 W. John St., Urbana, Ill., LB $763,317 (4 bidders) wid'n., resurf. U.S. 36 between Tuscola and Ill. 49, Douglas and Edwards Counties;

Ill.—**Standard Paving Co.**, 308 W. Washington St., Chicago, Ill., LB $1,513,442 (6 bidders) dual lane concrete paving 5.65 mi. FAI-5 north of Fithian, Vermilion Co. CD 8/19.

BUILDINGS—LB & CA

▲ **George A. Fuller Co.**, 597 Madison Ave., New York, N. Y., CA Est. $3,000,000, 1 story, 275,000 sq. ft. GLASS FABRICATING PLANT, CRESTLINE, O. Pittsburgh Plate Glass Co., 420 Fort Duquesne Blvd., Pittsburgh, Pa. Kellem & Foley, 1621 W. 1st St., Columbus, O., archts. CD 3/21.

▲ **Baker & Coombs, Inc.**, 601 E. Brockway Ave., Morgantown, W. Va., CA $637,700, general contract, HOSPITAL addn., STEUBENVILLE, O. Ohio Valley Hospital, Steubenville, O. Dan A. Carmichael, 5 E. Long St., Columbus, O., archt. Bids about Aug. 5.

▲ **Carl J. Reinke & Sons, Inc.**, 1522 W. Ford St., South Bend, Ind., CA $2,800,000, 6 SERVCE STATIONS, 6 RESTAURANTS, on Indiana Toll Rd., for Indiana Toll Road Comn., 309 W. Washington St., Indianapolis, Ind., St. Joseph, Elkhart and LaPorte, INDIANA. Standard Oil Co. of Indiana, 910 S. Michigan Ave., Chicago, Ill. Bids July 31. CD 7/29.

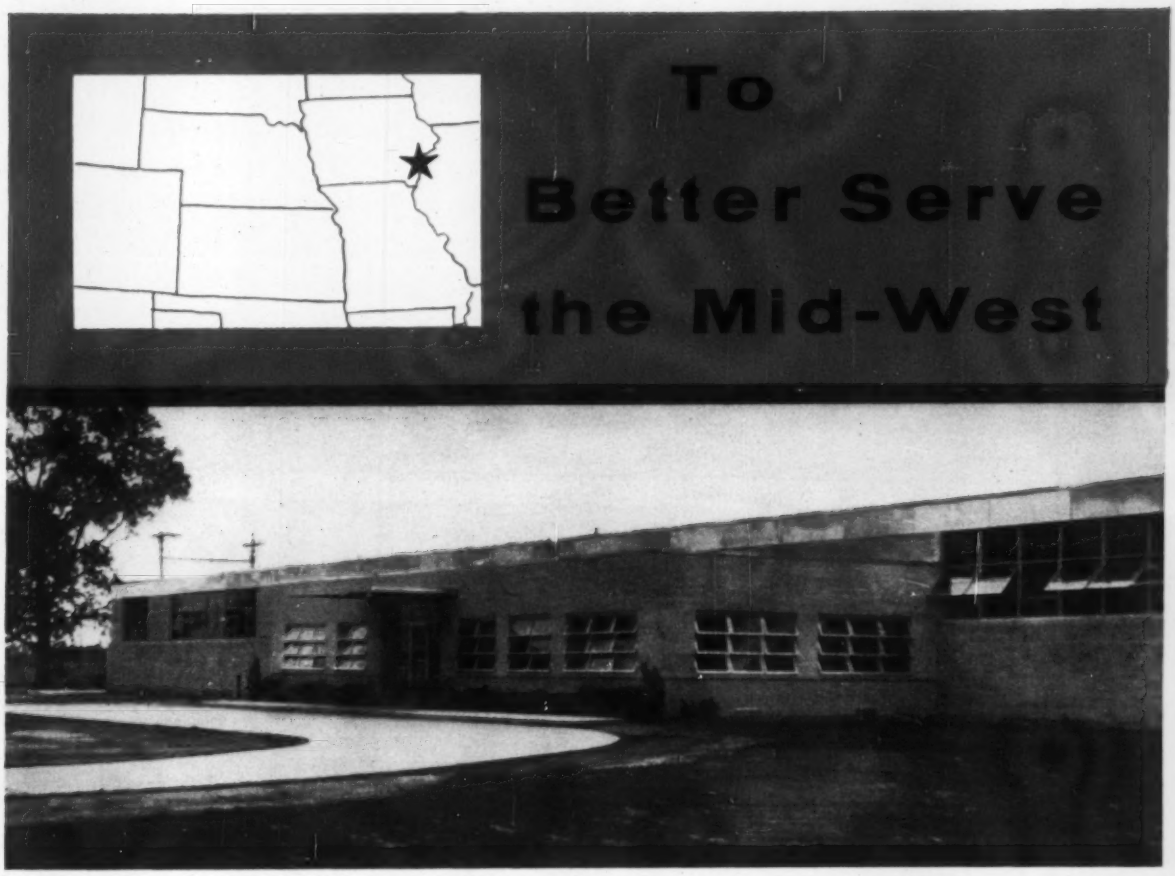
▲† **Malan Constr. Co.**, 2 Park Ave., New York, N. Y. CA $3,690,000, superstructure, FUEL TECHNOLOGY CENTER, Argonne National Laboratory, LEMONT, ILL. Atomic Energy Comn., Argonne National Laboratory, Bailey and Bluff Aves., Lemont, Ill. Bids Aug. 29. CD 9/4, under LB.

▲ **Robin Constr. Co.**, 1333 N. Wells St., Chicago, Ill. CA $2,000,000, Old Orchard BOWLING ALLEY, incl. lounge, snack bar, etc., Skokie Blvd., SKOKIE, ILL. Nelson Harris, c/o Paper Mate Co., Merchandise Mart, Chicago 54, Ill. CD 9/18/58.

▲ **Industrial Gencon, Inc.**, 3813 Buffalo Speedway, Houston, Tex., CA Est. $2,000,000, PLANT to recover sulphur from hydrogen sulfide, WOOD RIVER, ILL. Anlin Co., 3813 Buffalo Speedway, Houston, Tex. F. Ray Martin Engineers, Inc., 407 N. 8 St., St. Louis 1, Mo., engr.

▲ **Shell Oil Co.**, Wood River, Ill., and 50 W. 49 St., New York, N. Y. Separate Contracts, RECOVERY PLANT, consisting absorber columns and related equipment for recovery of hydrogen sulfide from fuel gas, WOOD RIVER, ILL. CD 6/18.

(Continued on page 98)



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Tousey engineers and designers have planned this new plant to be one of almost complete automation—from storage tanks and bins through the mixing process to the end product all is handled automatically and without interruption. Complete shipping facilities allow a choice of truck or rail delivery. With this latest type equipment installed throughout, the production in this compact 20,000 sq. ft. plant can exceed 1,000,000 gallons of paint per year.

For more than 70 years Tousey has been supplying weather resistant paints, varnishes, sealers, lacquers and synthetics to agricultural and industrial manufacturers all over the country. With this new addition at East Moline, Ill., Tousey hopes to better service their many customers in the Mid-West.

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TOUSEY VARNISH CO.

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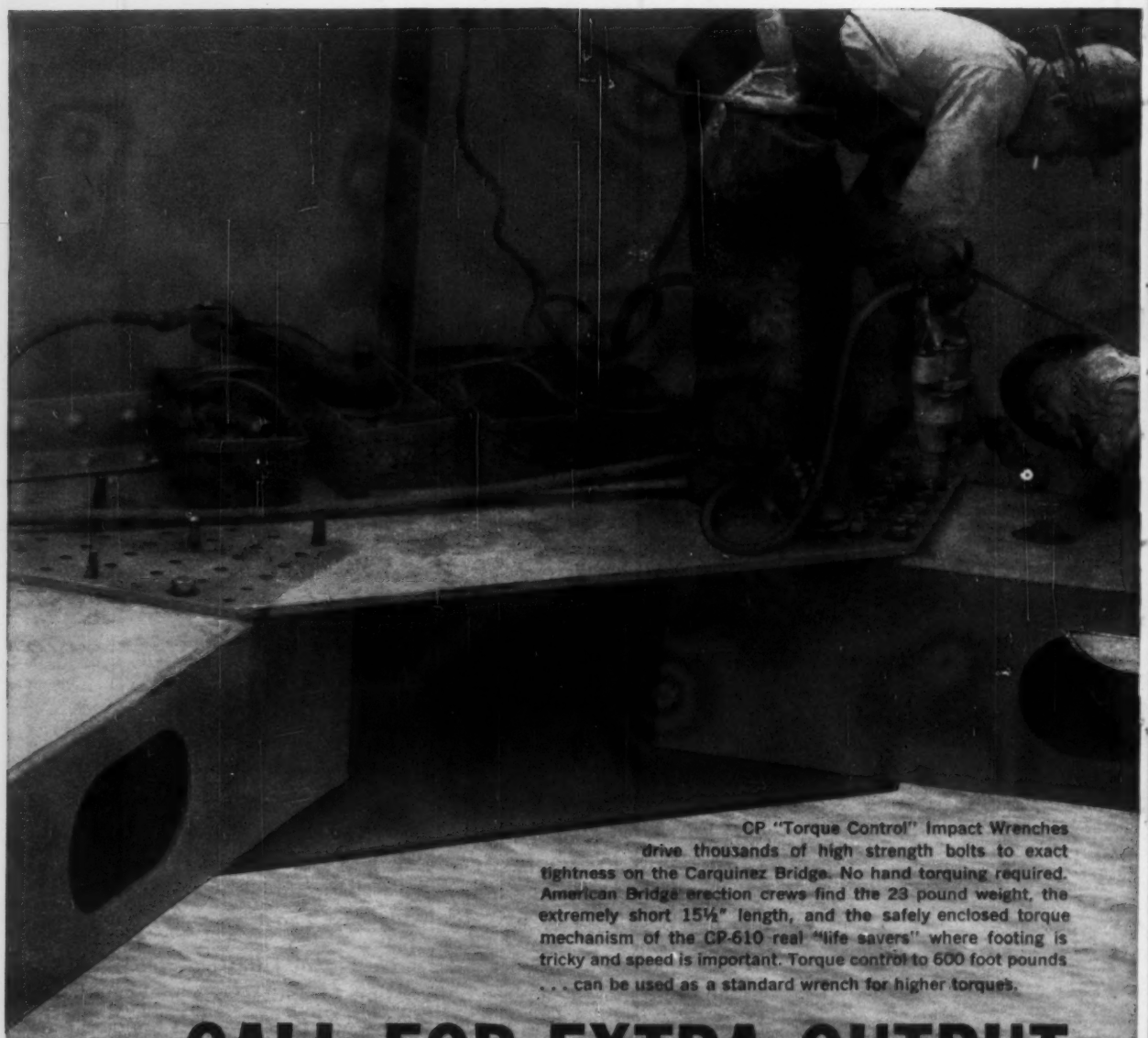

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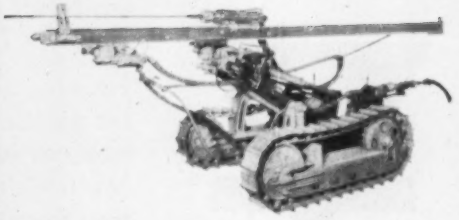

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(Continued from page 94)

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
October 2 Kansas
STREETS AND ROADS
October 2 Kansas

BUILDINGS—BA

▲ **Colo., Denver**—SCHOOL—BA 10/1—School Dist. No. 1, 414 41st St., 1, 2, and 3 story, 256,400 sq. ft. Thomas Jefferson Junior-Senior High School. $4,000,000. Smith, Hegner, 1659 Grant, archts. CD 8/15.

▲ **Minn., Moorhead**—FIELD HOUSE, etc.—BA 10/14—State Dpt. Admin., 19 State Capitol, St. Paul, 280 x 315 ft. (3 sections) relocating constr. and equipping field house, auditorium, stadium and physical education bldg. at Moorhead State College. $1,600,000. Plans deposit $30. Melander, Fugelso & Assocs., 603 Alworth Bldg., Duluth, archts. CD 7/3.

▲ **Minn., Brainerd**—SERVICE—BA 10/15—State Dpt. Admin., 19 State Capitol, St. Paul, 2 story, bsmnt., Service Bldg. No. 2 at Brainerd State School and Hospital. $2,700,000. Plans deposit $50. Toltz, King, Duvall, Anderson & Assocs., 1408 Pioneer Bldg., St. Paul, engrs. CD 2/7.

▲ **Mo., St. Louis**—HOUSING—BA 10/28—St. Louis Housing Auth., 2031 Olive St., Zone 3, two 9 story, one 8 story and one 12 story bldg. for Housing Proj. MO-1-74 and remodeling boiler plant in Proj. Mo-1-2 between 12th Blvd., 14th St., Chouteau and Lafayette Aves. $6,650,000. Plans deposit $100. Heilmuth, Obata & Kassabaum, Inc., 315 N. 10th St., Zone 1, archt. Wm. C. E. Becker, 411 N. 7th St., Zone 1, structural engr. John D. Falvey, 316 N. 8th St., Zone 1, mechanical engr. CD 6/12.

HEAVY CONSTRUCTION—LB & CA

▲ **TEXAS**—State Hy. Comn., Austin, Bids opened 9/16,
Tex.—**Wendel Constr. Co.**, P. O. Box 231, El Campo, Tex. LB **$141,723**, grade, etc. 4.077 mi. Hy. SH 172 Proj. DS 73 (4) Jackson Co.; LB **$288,406**, grade, etc. 3.256 mi. Hy. SH 35. Proj. F 1059 (5) Calhoun Co.;
Tex.—**South Texas Constr. Co.**, Box 3536, Corpus Christi, Tex. LB **$170,200**, grade, etc. 3.297 mi. Hy. FM 762. Proj. C. 543-3-8 Fort Bend Co.; LB **$198,740** grade, structures, etc. 5.003 mi. Hy. SH 119 Proj. S 1819 (2) DeWitt Co.;
Tex.—**Strain Bros., Inc.**, P. O. Drawer, 1631, San Angelo, Tex. LB **$628,524**, grade, etc. 17.276 mi. Hy. US 84 & 70. Proj. F. 640 (7) F. 503 (12) F 503 (13) & F. 568 (23) Bailey and Lamb Counties; LB **$505,422**, grade, etc. 8.587 mi. Hy. US 277 & SH 70, Proj. DS 213 (4) Coke Co.;
Tex.—**Cage Bros.**, 6959 San Pedro St., San Antonio, Tex. LB **$219,409**, grade, etc. 9.444 mi. Hy. FM 611 & 2481, Proj. R 083-2-4 & R 1747-3-1. Fisher and Jones Counties;
Tex.—**Collins Constr. & L. H. Lacy Co.**, Box 1192, Austin, Tex. LB **$1,942,308**, foundation course 6.011 mi. Hy. IH 35. Proj. I 35-4 (17) 317 & I 35-4 (6) 315, McLennan and Falls Counties;
Tex.—**Harry Campbell**, Rte. 5, Box 68-A, Abilene, Tex. LB **$429,250**, widen, grade, etc. 5.872 mi. Hy. US 83, Proj. DF 581 (14) & DF 581 (15) Taylor Co.;
Tex.—**Gaylord Constr. Co.**, P. O. Box 6157, Houston, Tex. LB **$490,781**, grade, structures, flex. base etc. 20.639 mi. Hy. SH 45. Proj. DF 485 (11) & DF 225 (6) Houston and Trinity Counties;
Tex.—**J. C. McLaughlin**, P. O. Box 1149, Bryan, Tex. LB **$109,986**, grade, etc. 3.166 mi. Hy. FM 1987 Proj. R. 1877-1-4, Polk Co.;
Tex.—**Ivan Dement, Inc.**, Box 1787, Amarillo, Tex. LB **$186,971**, grade, etc. 12.208 mi. Hy. FM 1541 Proj. S 2313, Randall Co.;
Tex.—**Parker Constr. Co.**, Box 3506, Odessa, Tex. LB **$185,746**, grade, etc. 7.683 mi. Hy. FM 1882 & US 80, Proj. C. 2005-1-2, C5-1-29 & C 4-7-21 Proj. C. 2005-1-2, C 5-1-29 & C 4-7-21, Ector Co.;
Tex.—**Stuckey Constr., Charles B. Jones & Concrete Structures, Inc.**, Box 1645, Wichita Falls, Tex. LB **$1,941,239**, grade, etc. 2.052 mi. Hy. US 287 & Spur 325, Proj. U. 3 (11) Wichita Co.;
Tex.—**Ballenger Constr. Co.**, Box 943, San Benito, Tex. LB **$130,519**, grade, etc. 4.987 mi. Hy. FM 507. Proj. R. 873-2&3-4&1, Cameron and Willacy Counties;
Tex.—**Killian-House Co.**, 4600 Broadway, San Antonio, Tex. LB **$1,484,235**, grad., etc. 6.715 mi. Hy. Loop 13, Proj. I-S1-4 (8) 576, Bexar Co.;
Tex.—**F&C Engineering**, P. O. Box 2426, Houston, Tex. LB **$1,487,358**, grade, etc. 8.526 mi. Hy. US 59 Proj. F 514 (26), F.FG 514 (27) & 514 (28), Harris and Fort Bend Counties;
Tex.—**Uvalde Constr. Co.**, P. O. Box 10286, Dallas, Tex. LB **$505,649**, widen concrete pavement, 7.078 mi. Hy. US 87, Proj. DF 385 (23) Ellis Co.;
Tex.—**Centex Paving Co.**, Box 9062, San Antonio, Tex. LB **$487,564**, grade, etc. 38.004 mi. Hy. SH 51 and 329. Proj. S 649 (7) & S 12 (4) Crane Co.;
Tex.—**Foley & Williams Contrs.**, 243 Owen Bldg., Tyler, Tex. LB **$138,522**, grade, etc. 9.563 mi. Hy. SH 26, Proj. DS 75 (6) Upshur Co.;
Tex.—**Hugh McMillan, Inc.**, Box 1612, El Paso, Tex. LB **$201,919.**, grade, etc. 13.605 mi. Hy. RM 2462. Proj. R 957-10-2 Brewster Co. CD 9/5.

▲ **MONTANA**—State Hy. Comn., Helena, Bids opened 9/12,
Mont.—**F&S Contg. Co.**, 1300 Chicago, Butte, Mont. LB **$1,793,112**. steel interchange Hy. 91 over Int. Hy. combination steel railroad overpass and concrete interchange over Hy. 2; grade and oil 5.623 mi. Int. Hy. west of Shelby, Toole Co.;
Mont.—**C. B. Lauch Constr. Co.**, 104 4th Ave. N., Great Falls, Mont. LB **$336,421**, 9 bridges over Otter Creek Hy. 87 starting mile south of Armington and extend. east, Cascade Co. CD 8/27.

BUILDINGS—LB & CA

▲ **Fischer & Frichtel, Inc.**, and **Design & Construction, Inc.**, 8703 St. Charles Rock Rd., Overland 14, Mo., CA **$3,025,825**, 288 DWELLING UNITS in 96 bldgs. and MAINTENANCE BLDG. on site, Proj. MO-4-1, JEFFERSON BARRACKS, (St. Louis 23 P.O.), MO. St. Louis County Housing Auth., 1306 Civic Center Dr., Lemay 23, Mo. Bids Sept. 9. CD 8/15.

▲ **Manhattan Constr. Co.**, 1804 Classen, Oklahoma City 6, Okla., CA Est. **$2,000,000**, Belleview SHOPPING CENTER, N. Pennsylvania and 59 St., OKLAHOMA CITY, OKLA. Ben C. Wileman & Co., 5103 North Shartel, Oklahoma City, Okla. Sorey, Hill & Sorey, 809 N.W. 36 St., Oklahoma City, Okla., archts. Awarded Sept. 11. CD 3/3.

▲ **Allen Field Enterprises, Inc.**, 5206 Warm Springs, Houston, Tex. Owner Builds. **$1,500,000**. 170 unit APARTMENT, 3800 block N. Braeswood Blvd., HOUSTON, TEX. CD 9/18.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
October 15 California
STREETS AND ROADS
October 15, 16 California

▲ **Calif., San Diego**—BA 11/7—San Diego County Water Auth., 2750 4th Ave., constr. portion 3rd section of San Diego Aqueduct, 16.8 mi. 66 and 69 in. pipe, Spec. 203. $8,500,000. CD 7/31/57.

▲† **Washington**—BA 11/21—U. S. Eng., 1917 S. Alaskan Way, Seattle, Zone 4, constr. rockfill Eagle Gorge Dam on Green River, with crest length of 450 ft. and height of 235 ft. above river bed, Kanasket, Inv. 59-6. $7,000,000. CD 11/13.

BUILDINGS—BA

▲† **Wash., Richland**—PLUTONIUM TEST REACTOR FACILITIES—BA 10/29—Atomic Energy Comn., P. O. Box 550, plutonium test reactor facilities at Hanford Works, Phase III. CD 9/12.

HEAVY CONSTRUCTION—LB & CA

▲ **WASHINGTON**—State Hy. Comn., Ernest J. Ketcham, chn. Dpt. Hys., Olympia, Bids opened 9/16,
Wash.—**Northwest Constr. Co.**, 3950 6 Ave. N. W., Seattle, Wash., LB **$1,797,426**, surf., constr. cement treated base and bit. surf. treatment, paving with c. conc. and b. conc. and fencing 5.029 mi. Primary State Hy. No. 1, Pierce Co.;
Wash.—**Osberg Constr. Co.**, 1128 North 128 St., Seattle 33, Wash., LB **$1,069,759**, grading, surf. with special ballast and fencing 5.722 mi. Secondary State Hy. No. 13-A, Cedar River to North River, Pacific Co. CD 9/3.

▲ **D. M. Drake Co.**, 1600 N.W. Savier St., Portland, Ore., CA **$3,832,177**, grading 11 mi. new roadbed for Great Northern Railroad's Okanogan branch and constr. 9 mi. U. S. Hy. 97 along west bank of Columbia River, WASHINGTON, Chelan County Public Utility Dist., 327 N. Wenatchee Ave., Wenatchee, Wash. Bids Aug. 22. CD 8/27, under LB.

▲ **OREGON**—Hy. Comn., Hy. Bldg., Salem,
Ore.—**White Bros.**, 306 Mullen Ave., Walla Walla, Wash. CA **$351,967** (6 bidders) grading, paving 2.03 mi., shoulder piling 3.68 mi. FAIP I-5-3(7)137 Douglas Co.; CA **$272,177** (6 bidders) grading, paving, 1.38 mi. Comstock-Anlauf section, Pacific Hy. FAIP I-5-3 (5)163, Douglas Co.;
Ore.—**Warren Northwest, Inc.**, 9860 N. E. Hancock Dr., Portland, Ore., CA **$113,490** (3 bidders) grading, paving 0.65 mi. N. E. Glisan St., 122 to 136 Ave., Multnomah Co.; grading 1.25 mi. and paving 0.98 mi. North Plains Interchange, Sunset Hy. FAP DS-186(18) Washington Co.;
Ore.—**Brassfield & Purcell**, Salem, Ore., CA **$535,819** grading, stone base 3.75 mi. and paving 3.36 mi. Elkton-Smith Bridge section, Elkton-Sutherlin Hy., FAP DS-217(6) & S-217(7), Douglas Co.;
Ore.—**Roy L. Houck**, 1585 N. 20 St., Salem, Ore., CA **$739,796**, grading 6.86 mi., two 105 ft. trestles, Belts Rd.-Lane Co. section Pacific Hy., FAIP I-5-4 (19)204, Linn Co.;
Ore.—**E. H. Itschner**, Molalla, Ore., CA **$172,328** stone base and oiling 16.69 mi. Ukiah-Hilgard Hy., FAP DS-57(6), Union Co.;
Ore.—**Peter Kiewit Sons Co.**, Box 531, Vancouver, Wash. CA **$406,586**, grading, 1.45 mi. and paving 1.3 mi. Hunter Creek-Buena Vista Wayside section of Oregon Coast Hy., FAP BF-124(15), Curry Co.;
Ore.—**M. C. Lininger & Sons**, Box 1386, Medford, Ore. CA **$106,512** (4 bidders) North Grants Pass Interchange Pacific Hy.; FAIP I-5-1(2)58, Josephine Co.;
Ore.—**Natt McDougall Co.**, Pittock Block, Portland, Ore. CA **$1,126,788** (11 bidders) grading 6.07 mi. Linn County line-McKenzie River section Pacific Hy., FAIP I-5-4(20)198, Lane Co.;
Ore.—**Rogers Constr. Co.**, 11760 N. E. Glisan St., Portland, Ore., CA **$1,699,492**, paving 14.3 mi. Sundial-Multnomah Falls section of Columbia River Hy., FAIP I-82-1(11)14 and 182-2(7)15, Multnomah Co.;
Ore.—**Fred H. Slate Co. & E. C. Hall Co.**, 7805 S. W. 40 Ave., Portland, Ore. CA **$497,258**, grading, paving 3.45 mi. Middleton-Yamhill County line section Pacific Hy., FAP DF-73(13), Washington Co. Grand total $6,312,702. Bids Sept. 9, awarded Sept. 11.

▲† **N. P. Van Valkenburg**, 1627 N. Chico Ave., El Monte, Calif. LB **$2,273,000**, roads and utilities, soil erosion control work, distr. sys. diesel generator units, water distr. sys. Naval Missile Facility, Point Arguello, Spec. 19441/58, POINT MUGU, CALIF. Eleventh Naval Dist., 1220 Pacific Hy., San Diego, Calif. Bids Sept. 16. CD 9/5.

▲ **Gunther & Shirley**, 4560 Sherman Oaks Ave., Sherman Oaks, Calif., **E. V. Lane**, 2675 Park Blvd., Box 417, Palo, Alto, Calif., **Thomas Constr. Co.**, 4665 E. Hedges St., Fresno, Calif. and **Harms Bros.**, 5261 Stockton Blvd., Sacramento, Calif. CA **$5,230,175**, Cherry Power House at Hetch Hetchy Proj., incl. two 93,000 kw. turbines installing transformers and penstocks, SAN FRANCISCO, CALIF. Pub. Utilities Comn., City Hall, San Francisco, Calif. Bids Sept. 4, awarded Sept. 16. CD 9/9, under LB.

▲ **C. Norman Peterson**, 2830 9th St., Berkeley, Calif. CA **$1,148,000**. Bond Tempe water treatment plant and supply lines, Bon Tempe Dam area, SAN RAFAEL, CALIF. Marin Municipal Water Dist., 874 4th St., San Rafael, Calif. Bids July 23. CD 7/30, under LB.

BUILDINGS—LB & CA

▲ **Seattle State** Church of Jesus Christ of Latter Day Saints, 117 Roy St., Seattle, Wash. Day Labor, **$1,000,000**, CHURCH addn., SEATTLE, WASH. C. B. Dobson, 4115 University Way, Seattle 5, Wash., archt.

▲ **York Constr. Co.**, 107 Orinda Hy., Orinda, Calif. CA **$1,350,000**. 113 HOME SUBDIVISION at Pittsburg Park, PITTSBURG, CALIF. Irwin Deutscher, Developer, 2350 Contra Costa Hy., Pittsburg, Calif.

▲ **R. J. Daum & Beyer & Abrahamson**, 12537 S. Cerise Ave., Hawthorne, Calif. CA **$3,104,000**, Granda Hills High SCHOOL, Zelzah St., LOS ANGELES, CALIF. Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids July 25. CD 7/30, under LB.

▲ **Twaits-Wittenberg Co.**, 507 Bixel St., Los Angeles, Calif. LB **$2,618,000** (6 bidders) general constr. two 3 story each 70,000 sq. ft. floor area and 1 with 23,700 sq. ft. bsmnt., SCIENCE CLASSROOM BLDGS. at San Fernando Valley State College, W. O. 4005GC-59, LOS ANGELES, CALIF. State Div. Architecture, 1100 S. Grand Ave., Los Angeles, Calif. Bids Sept. 11. CD 8/8;
George Kauffman, 5050 Vineland Ave., North Hollywood, Calif. LB **$565,678** (14 bidders) mechanical work (Los Angeles, Calif.);
Charles A. Langlais Co., 180 Glendale Blvd., Los Angeles, Calif. LB **$435,968** (6 bidders) electrical work (Los Angeles, Calif.).

▲ **H. B. Nicholson**, 880 E. Colorado St., Pasadena, Calif. CA **$4,174,000** constr. Pasadena HIGH SCHOOL, 2925 Sierra Madre Blvd., PASADENA, CALIF. Pasadena Bd. Educ., 351 S. Hudson St., Pasadena, Calif. Bids Aug. 5. CD 8/11, under LB.

CANADA

HEAVY CONSTRUCTION—LB & CA

▲ **BRITISH COLUMBIA**—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont.,
John Laing & Sons (Canada) Ltd., 640 West Hastings St., Vancouver, B. C., CA **$1,962,882**, grading, culverts and sub-base constr. Mile 0 to Mile 7.7, Trans Canada Hy. Mount Revelstoke National Park, Revelstoke. Bids July 29. CD 8/7.

▲ **C. A. Pitts General Contractor Ltd.**, 30 Commercial Rd. Toronto, Ont. and **Foley Bros.**, Vermilya St., Pleasantville, N. Y. U. S. A. (joint venture), CA Est. **$7,000,000** constr. 193 mi. railroad alongside access road from Port Cartier to Lac Jeannine at iron ore mine for hydro-electric plant, SHELTER BAY, QUE. Quebec Cartier Mining Co., 1255 Laird Blvd., Mount Royal, Montreal 16, Que. Bids July 15. CD 6/13.

BUILDINGS—LB & CA

▲ **Edmonton Constr. Co., Ltd.**, 9304 Jasper Ave., Edmonton, Alta., CA **$1,949,450**, frame BUILDINGS at Fort Simpson, FORT SIMPSON, N. W. T. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Awarded Sept. 4. CD 8/7, under LB.

▲ **M. Sullivan & Son Ltd.**, 445 Montreal St., Kingston, Ont., CA **$1,000,000** (8 bidders) 4 story, 90 x 230 ft., structural steel frame, limestone walls, OFFICE and CLASSROOM BLDG., KINGSTON, ONT. Queen's University, Kingston, Ont. Bids Sept. 9. CD 8/26.

▲ **Robert McAlpine Ltd.**, 2249 Yonge St., Toronto, Ont. LB **$1,082,760** (1 bidder) combined QUARTERS and MESS for all ranks of Canadian Army Camp, COBOURG, ONT. Defence Constr. (1951) Ltd., 56 Lyon St., Ottawa, Ont. Bids Sept. 9. CD 8/29.

ALASKA

HEAVY CONSTRUCTION—LB & CA

▲† **Marwell Constr. Co. Ltd.**, 1500 W. Georgia St., Vancouver, B. C., and **Foster-Saunders**, 1312 10 Ave., Anchorage, Alaska, CA **$2,260,063**, constr. 5,000 ft. tunnel, intake structure and access road, Cooper Lake hydro project, Anchorage, ALASKA. Chugach Electric Assn., Inc., 8 and Gambell Sts., Anchorage, Alaska, Bids Sept. 9. CD 9/11, under LB.

PUERTO RICO

HEAVY CONSTRUCTION—LB & CA

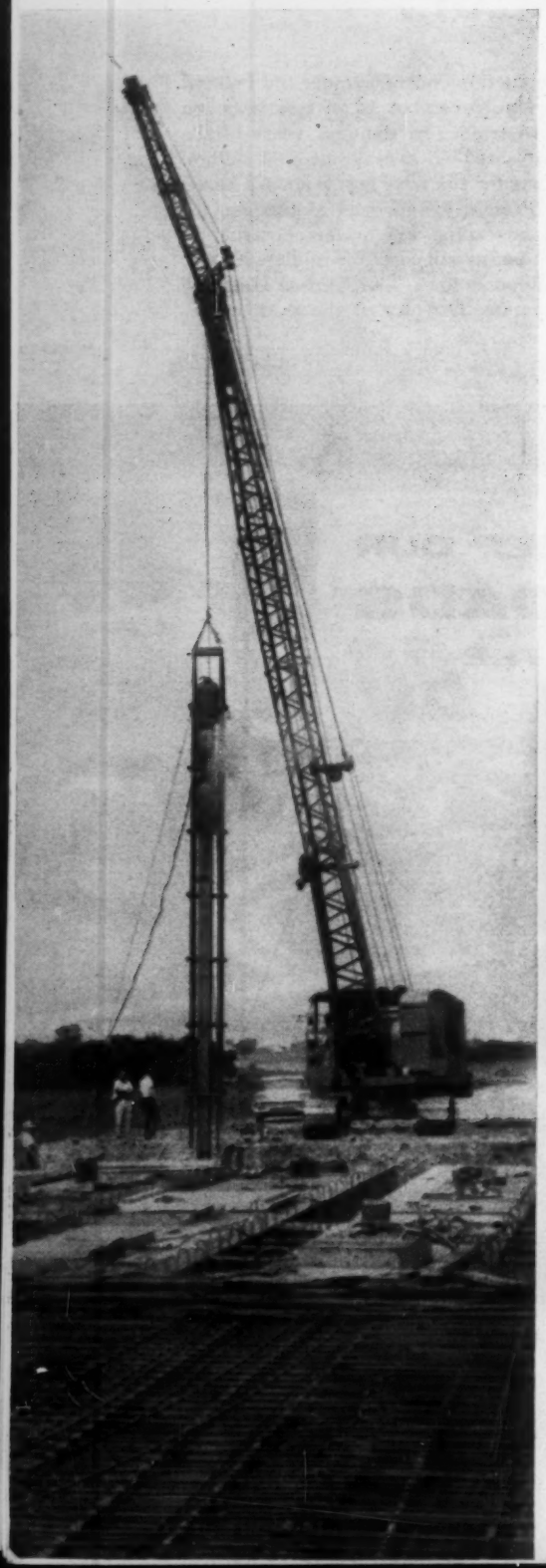
▲† **Procurement Officer**, Ramey Air Force Base, Puerto Rico, rejected bids Aug. 12, rehabilitation and imprvs. to 995 units Wherry Housing, PUERTO RICO. Will re-advertise. CD 7/24.

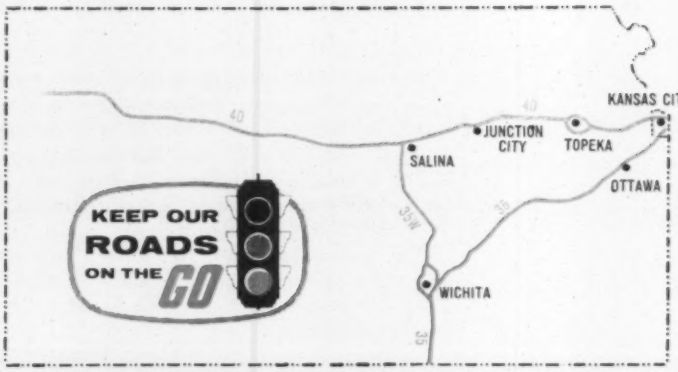
(Proposal Advertisement see pp. 112 to 114)

Kansas Highway Program moves even faster...

Kansas was the first state to complete a construction contract under the Federal Interstate Highway Program begun in 1956. On November 14 of last year, an 8-mile section of U.S. Route 40 was opened to traffic. In the first years of the Federal Highway Program, Kansas has appropriated an average of 33.4 million dollars annually for highway improvement. Plans for the next few years are based on spending an increased amount annually. Presently approved is the sum of $63,453,020 for grading, draining, surfacing, landscaping and bridge construction on 130 miles of roadway. 16.8 miles of urban roadways will cost 16.9 million dollars; 114 miles of rural roadways will cost 46.4 million dollars. The Kansas Highway Program is under the direction of Maurice Martin, Director of the State Highway Commission.

...and products of United States Steel





Kansas Interstate System grows! 770 miles of Interstate Highway will cross Kansas from east to west and connect its principal cities with neighboring Oklahoma to the south. About 175 miles of the Kansas Turnpike have been incorporated into the Interstate System. Now under construction are 15.5 miles of Route 40 between Topeka and Junction City and 52 miles of Route 35 between Kansas City and Ottawa.

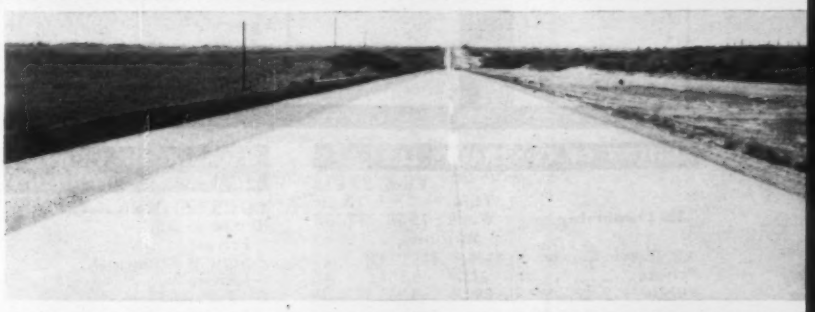
On Route 35 USS Steel H-Beam Bearing Piles are driven down to bedrock for a bridge over Ottawa Creek. USS Steel Bearing Piles speed the solution of difficult foundation problems economically. And for concrete construction, USS *Di-Lok* Reinforcing Bars have a continuous diamond-locking deformation that strengthens the bond between concrete and steel, providing positive anchorage and prohibiting longitudinal movement of the bars.

500 tons of steel and an estimated $100,000 were saved by using USS *Tri-Ten* Steel in heavily stressed chords and diagonals on this, the largest bridge in the Kansas Turnpike. These parts were able to be made thinner and lighter because of *Tri-Ten* Steel's greater strength. With a yield point of 50,000 psi minimum, *Tri-Ten* Steel meets all requirements of ASTM Specification A-242 for high-strength low-alloy steel.

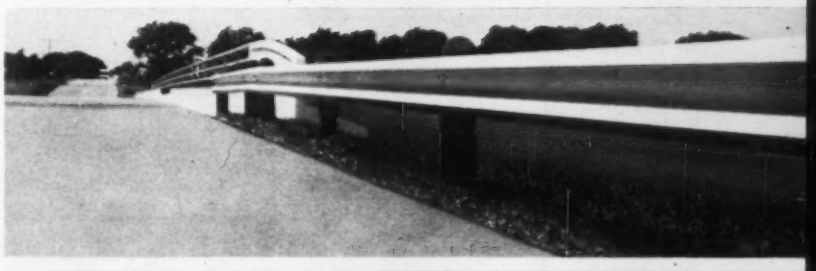
help keep it moving along!

Welded Wire Fabric goes down on Route 35. USS *American* Welded Wire Fabric is a top-quality, cold-drawn steel wire able to withstand high unit stresses and permits construction of slabs up to 100 feet long for a smoother riding surface. *American* Transverse Road Joint Load Transfer Assemblies and *American Super-Tens* Stress-Relieved Strand and Wire are also available to add strength and long life to various concrete applications.

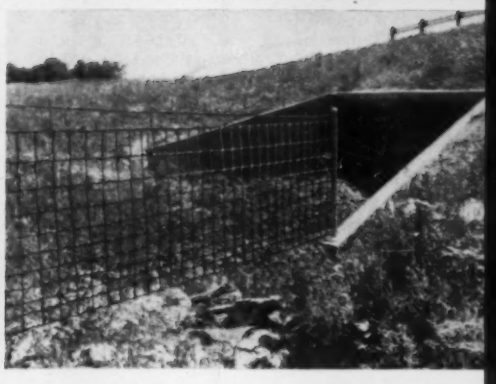
This stretch of pavement was constructed under the first contract completed under the Federal Interstate Highway Program. Companion two-lane strip of U.S. Route 40 west of Topeka is ready for paving. Most Kansas Interstate Highways will feature medians of 60 feet to allow construction of two additional lanes between strips now planned. Universal Atlas Cement Division of United States Steel furnishes *Atlas Duraplastic* air-entraining cement, *Universal* regular and air-entraining portland slag cements, *Atlas* regular and air-entraining high-early cement, as well as *Universal* and *Atlas* portland cements to meet every concrete paving need.



USS American Highway Beam Guard Rails for interchanges, fill sections, and curves help control the effects of recklessness and will safeguard traffic at designated speeds. "Western" Highway Guard Rail (in the Pacific coast area) and USS *American* Multisafty Cable Highway Guard are also available to help build safety into thousands of potential trouble spots along the Federal Interstate System.



Drainage of median strips on U.S. Route 40 is carried through corrugated pipe fabricated from USS Culvert Sheets to flare plate which distributes run-off onto shelf rock. Many cattle passes and hundreds of miles of expressways are guarded by USS *American* fence to prevent livestock and wild animals from wandering on to roadways to endanger themselves and travelers.



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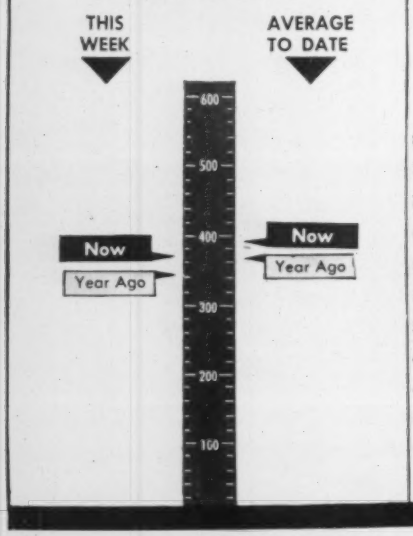
USS United States Steel

Divisions of United States Steel serving the highway market: American Bridge Division, Pittsburgh, Pa. American Steel & Wire Division and Cyclone Fence Department, Cleveland, Ohio • Columbia-Geneva Steel Division, San Francisco, Calif. • Consolidated Western Steel Division, Los Angeles, Calif. • National Tube Division, Pittsburgh, Pa. • Tennessee Coal & Iron Division, Fairfield, Alabama • Universal Atlas Cement Division, New York • United States Steel Supply Division, Steel Service Centers, Chicago, Illinois.

Construction Scoreboard

ACTIVITY THIS WEEK

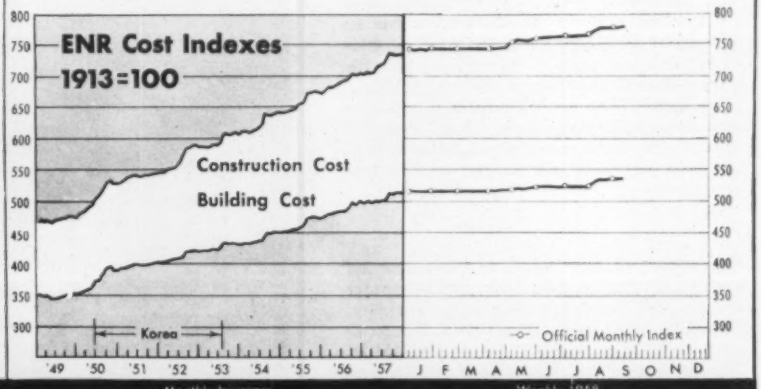
Contract Awards
Millions of Dollars



COST INDEXES AS OF NOW

ENR INDEXES (1913=100), 20-cities' average	Week of Sept. 18 1958	% Change from Aug. 21 1958	% Change from Sept. 19 1957
Construction Cost	775.61	+0.33	+5.19
Building Cost	536.36	+0.38	+3.88

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518



AMOUNT OF CONTRACTS LET

By Ownership	This Week millions	Cum. 39 wks 1958 millions	Cum. 39 wks Chge '57-'58 %
All Heavy Constr.	$370.7	$15,079.8	+7
Private	123.9	6,124.6	−6
Public	246.8	8,955.2	+19
State & Municipal	216.2	6,572.2	+16
Federal	30.6	2,383.0	+26
By Type of Work			
Public			
Waterworks	12.7	246.2	−6
Sewerage	11.9	466.8	+10
Bridges*	20.2	542.7	−1
Highways	99.2	2,732.4	+16
Earthwork, Waterways	21.9	824.3	−3
Buildings, Excl. Housing	54.9	2,005.0	+17
Housing	11.7	992.5	+91
Unclassified	14.3	1,154.5	+33
Private			
Mass Housing	63.6	2,962.5	+28
Commercial	23.0	1,444.3	+8
Industrial	27.9	1,370.9	−46
Unclassified	9.4	337.7	−8

* Includes private bridges.

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

NEW CAPITAL FOR CONSTRUCTION

	Week of Sept. 18 millions	Cum. 38 wks 1958 millions	Cum. 38 wks Chge '57-'58 %
Corporate Securities	$181.6	$4,107.0	−4
State and Municipal:			
All Except Housing	158.8	4,721.0	+18
Housing	53.4	87.2	−44
Federal Loans	1.1	141.3	−16
Federal Aid	2,380.0	2,596.2	+20
Total Nonfederal	$2,774.9	$11,652.7	+9
Federal Appropriations:			
Projects in U. S.		$3,946.1	+42
Outside U. S.		12.8	−56
Total New Capital	$2,774.9	$15,611.6	+15

BACKLOG OF PROPOSED HEAVY CONSTRUCTION

	August 1958 (millions)	Percent Change from last Month	Percent Change from last Year
Total U. S. (ENR reported)	$111,493	−0.1	+2.6
By Ownership—			
Private	48,151	+0.4	+4.7
State & Municipal	50,225	−0.4	+1.1
Federal	13,117	−0.3	+0.7
By Type of Work—			
Waterworks	2,651	−0.2	+14.1
Sewerage	3,430	+0.5	+4.0
Bridges	3,314	−1.2	+1.0
Highways	13,008	−1.2	+1.5
Earthwork, Waterways	11,648	−0.2	−3.0
Public Buildings	19,841	−0.04	−0.04
Industrial Buildings	16,461	−0.4	+0.1
Commercial Buildings (including housing)	21,796	+1.2	+10.1
Unclassified, Private	9,894*	+0.2	+1.6
Unclassified, Public	9,450	−0.4	+3.5

* Includes private bridges $83 million

FLOW OF NEW PROJECTS INTO THE BACKLOG

	1958 Aug. (millions)	1958 8-months (millions)	Percent Change from '57 Aug.	Percent Change from '57 Year Cum.
Total U. S. (ENR reported)	$878	$9,973	−69.7	−28.7
By Ownership—				
Private	493	4,591	−52.8	−28.7
State & Municipal	333	4,575	−81.8	+34.4
Federal	52	807	+176.1	+43.7
By Type of Work—				
Waterworks	12	388	−78.3	+27.6
Sewerage	60	428	+30.7	+4.3
Bridges	10	267	−95.0	−44.3
Highways	27	1,112	−74.9	−35.4
Earthwork, Waterways	5	154	−99.5	−85.5
Public Buildings	220	2,333	−45.3	−21.3
Industrial Buildings	60	805	−81.1	−63.4
Commercial: Mass Housing	185	1,509	−6.9	−6.9
Other Building	206	2,017	−8.3	+9.7
Unclassified, Private	43	260	−85.9	−66.7
Unclassified, Public	50	698	−40.0	+16.9

FLOW OF PROJECTS OUT OF BACKLOG INTO CONTRACTS

Total U. S. (ENR reported)	791	7,221	−16.4	+8.0
By Ownership—				
Private	252	2,048	−32.2	−20.5
State and Municipal	444	3,784	−4.1	+19.1
Federal	95	1,390	−14.8	+35.0

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3. Weekly Service & Inspection Report—an up-to-date record of mechanical condition of equipment, work to be done or completed.
4. Delivery Ticket—lists petroleum supplies delivered to equipment on the job.
5. "Squawk" Sheet—used by equipment operator to point out trouble spots that need attention.

Available—film on equipment safety, maintenance. Call nearest Socony Mobil office.

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Another reason you're Miles Ahead with Mobil!

SOCONY MOBIL OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION

The new lift span on the Celilo Bridge over the Columbia River is being raised to permit river passage. Westinghouse supplied all the major elements of the electrical system, which can raise the span to 75 feet above mean high water in 90 seconds.

Sid Brown, Westinghouse sales representative, at right, is shown discussing approval of electrical control system with Mr. Don Thomas, assistant engineer of structures for Spokane, Portland and Seattle Railway; Mr. Glen Emory and Mr. Ed Bohm, partners of Emory and Bohm, electrical contractors.

Celilo Railway Lift Bridge uses new Westinghouse static skew control

When construction of the Dalles Dam caused the Columbia River to rise closer to the deck of the Oregon Trunk Railway's Celilo Bridge, it became necessary to build a lift span to let river traffic pass beneath. A Westinghouse d-c adjustable-voltage drive, incorporating static skew control, was installed to provide smooth acceleration and a precise regulating system to keep the span level.

Set between two towers, the span is counterweighted and suspended by wire ropes passing over sheaves at the top of each tower. Two Westinghouse d-c mill motors in each tower drive the sheaves and are electrically synchronized by the d-c adjustable-voltage system to keep the span level when operating. The various operations are so interlocked that they must follow a predetermined sequence to assure maximum equipment and personnel safety. The skew control equipment has safeguards against abnormal conditions and requires minimum maintenance.

Westinghouse equipment used on the Celilo Bridge includes: the main d-c drive motors, brakes, motor-generator, control regulating exciters, control board, an operator's console, emergency drive a-c gearmotors and a 225-kva outdoor power center.

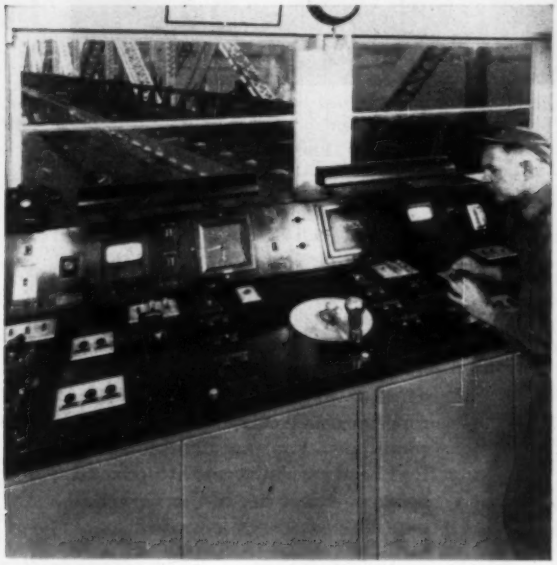
Westinghouse, as sole supplier of the coordinated electrical system, assumed undivided responsibility for its overall operation. For further information showing how this complete, single-source supply can benefit you, contact your Westinghouse electrical construction engineer, or write: Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pennsylvania. J-94116

Owner: Oregon Trunk Railway (Operated by Spokane, Portland & Seattle Ry.)
Consulting Engineers: Howard, Needles, Tammen & Bergendoff, Kansas City, Mo.
General Contractor: Kansas City Bridge Co., Kansas City, Mo.
Steel Fabricators: Pacific Car & Foundry Co., Seattle, Wash.
Electrical Contractor: Emory and Bohm, Portland, Oreg.
Westinghouse Distributor: Westinghouse Electric Supply Company, Portland, Oreg.

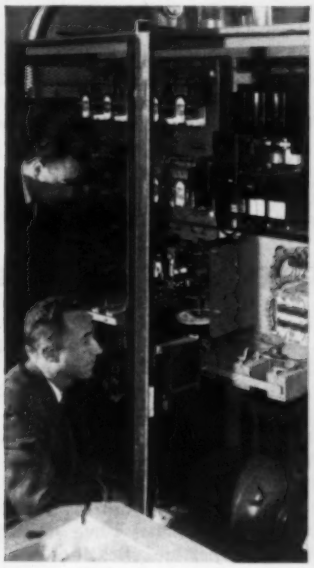
Over 250 Pages Westinghouse Data in Sweet's Construction File.

YOU CAN BE SURE... IF IT'S

Westinghouse

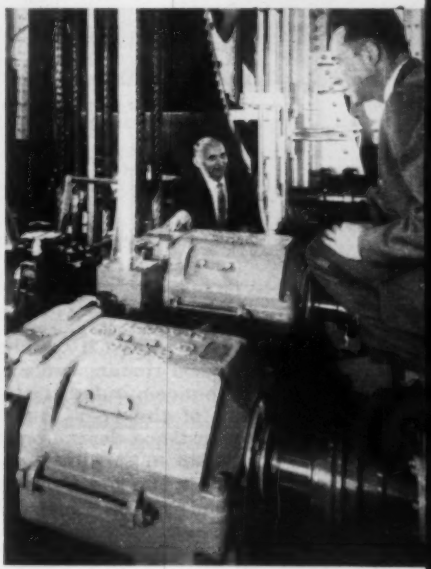


Chief operator, Champ King, at Westinghouse control desk. This desk centralizes the starting and stopping of railway traffic, selection of normal, auxiliary or emergency power supply, normal or emergency drive system and control of the lock and lift span.



Mr. Brown and Mr. Thomas inspect the interior of the main control cabinet which houses the Magamp* regulator panel and Rototrol® elements of the bridge control system.

*Trade-Mark



Mr. Bohm and Mr. Thomas examine the Westinghouse 33-hp Type MCA d-c mill motors, designed for heavy intermittent duty, which drive the main span machinery located at top of each tower.

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Durable protection assured by Red Lead paint, used on previous job in 1932, led to specification of red lead for renovations.

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Keeping New York City's subway system in good running order calls for maintenance-minded vigilance every day of the year. Outdoor tracks, for instance, depend on steel structures that must withstand exposure to sleet, sun and a variety of chemical and corrosive fumes. Yet despite these rugged conditions, the repainting job just completed on the supports of one line was the first in 26 years. The original covering was a long-lasting coat of protective red lead primer paint.

Red Lead's value has been proved in action on tanks and tankers, bridges and buildings throughout the world. Forty-seven out of 48 state highway departments have official red lead primer specifications.

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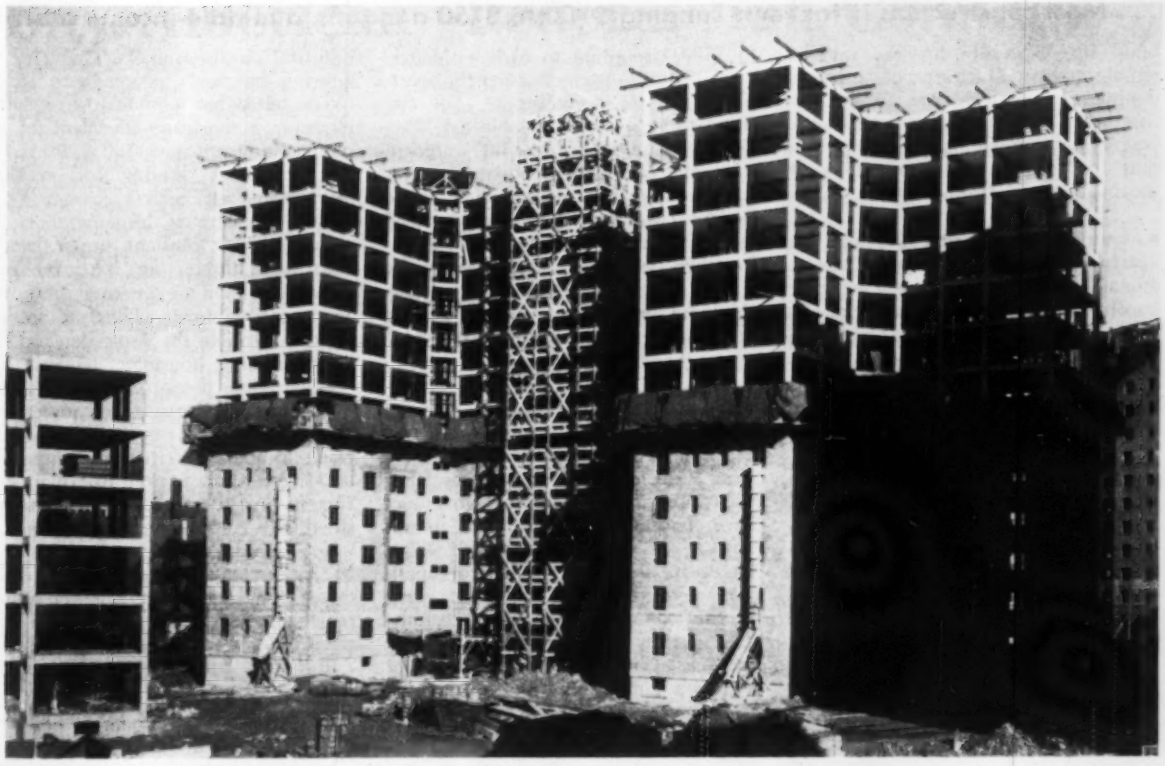

They're going up at a fast pace all over the country, but the big question is . . .

Will the Apartment Boom Last?

Some symptoms of morning-after discomfort have appeared in the nationwide spree of apartment construction now being enjoyed by builders.

An ENR survey of 24 cities shows the apartment surge in all stages of development. On the expanding West Coast, there are patches of overbuilding. In the East, some cities are just expecting a boom, some others aren't affected.

The big question asked in building circles today is, "Will it last?" Some observers wonder if tight money might not turn the building binge into a hangover, just as easy money gave it strong impetus early this year. Here are some typical comments:

From a Federal Housing Administration official: "Tighter money can't help but slow things down. In New York there's been a change in the last two weeks. Loan discounts on Section 207s (rental multiple units) were 2 points. Now they are 4 points or more and will go higher."

From a builder: "If tight money lasts a long time it will hurt. But I already have enough mortgage commitments to keep my men working for nine months."

Conclusion: An actual slowdown in apartment construction will not be felt for several months. Marginal projects now entering the financing stage may be delayed or killed if the rising cost of money boosts construction costs beyond what could be covered by rents at existing demand.

• **Throttle open**—The easier money climate of 1958 put a burst of speed behind apartment building. Starts on dwellings of three units and over totaled 64,400 units through May, compared with 46,800 in the same period of last year.

The pickup began in 1957. Starts on private dwellings of five or more units totaled 68,300 units, up from 57,800 units in 1956. This was a rise from 5.2% of all housing starts to 6.6%.

A lot of the credit goes to changes in the FHA insuring program in 1956 and 1957. Mortgage insurance limits on Section 207 housing were raised from 80% to 90% of appraised fair market value. In high construction cost areas, FHA mortgage limits were boosted for multiple-unit buildings averaging fewer than four rooms per unit, a size popular in big urban centers.

These and other changes helped bring apartment starts under FHA inspection to 18,297 units in 1957, triple the 1956 volume.

Here are some other factors behind the apartment construction upturn:

• There are more people in the renting population, partly because there are more elderly people.

• There is a move back to the city and its fringe areas by people living in outlying suburbs. This seems to be a factor in the larger cities.

• Land is expensive or scarce for individual housing in some highly developed areas.

• **A middle-income market**—The apartment construction rise thrives off middle-income people. Most construction appears to be for rents in the $100 to $150 a month range, or $35 to $50 per room. When asked why, some builders point out that until recently the emphasis has been on commercial and single-family structures. This has allowed a backlog of rental demand to

. . . Most construction is for rents ranging $100 to $150 a month, a middle-income market

build up, especially for the middle-rental group. Inflation of earnings doubtless has pushed more families into this group, and it also may be that some people are now willing to pay more in rent than the rule-of-thumb 25% of income.

• **Home owners vs renters**—Though the apartment movement is national, not regional, some cities in the East have hardly noticed it. Builders and city officials in Boston, Pittsburgh, Cincinnati and Detroit point to a tenacious home-owning tradition as the major reason. Behind this is the belief that suburbs are the best places to live.

This out-bound trend is often bolstered by business, says Paul M. Reid of Detroit's Metropolitan Regional Planning Commission. In Detroit, new factories and shopping centers are located outside the city because that is where people live, "and it looks as though this is where they'll continue to live," he declares.

Boston, however, may leave the column of bypassed cities if the civic energy generated by the $100 million Prudential Center project is not dissipated after its completion (ENR July 17, p. 105). The 5,000 apartment units planned for the project may start a chain reaction against prohibitive taxation and other impediments to needed rental construction—or so the optimistic talk of some builders and officials goes.

• **Testing demand**—In cities of moderate growth rate rental housing is approached cautiously by builders. In St. Louis, therefore, the sharp rise in applications for apartment construction this year is considered significant. The number involved is small, but more permits were issued in the first half of the year than in all of 1957.

In 1951 and again in 1957 high-rise apartment ventures of 200 units each year were successfully launched in St. Louis. But the real test will come with completion of the Plaza and Mill Creek urban renewal developments (ENR Jan. 23, p. 107). These will have a total of 3,190 rental units. Both are planned near the downtown area. The Plaza project has the firmest prospects and is due to open in 18 months. Already enough inquiries have been received to indicate success.

The new developments will have lower rental rates than the earlier high-rise buildings, which ranged from $110 to $850 per month. In the Plaza structures, rents will range from $90 to $200 a month, or about $42 per room. The Mill Creek apartments will rent for $80 to $180, according to early estimates.

Builders also are feeling out the apartment market in Baltimore, but the trend there is better established. Permits for multiple units hit a record total last year, though construction was hampered by the money pinch. One builder, Melvin T. Pugatch, moved into apartment construction from home-building because he sees this as the trend in the city. Other builders feel the same way, he says, and are looking at choice locations at the city's edge where there is good downtown access.

• **City land costly**—High cost of land has driven apartment construction for the middle-income group out of some cities into surrounding suburbs. For this reason, builders in Chicago proper have concentrated largely on high-rent unit and public housing. Over the last few years the city's volume of apartment permits has remained level, while in the suburbs it has grown steadily. The spurt of suburban permits this year was caused by the sudden loosening of the money market.

There has been no real satisfaction of suburban apartment demand in the Chicago area for years largely because it was hard to obtain financing, explains James Downs of Real Estate Research Corp. "We've had an unreasonable percentage of new housing in single-family homes, but not everybody wants to live in a house."

In New York City, particularly Manhattan, medium-rental demand has been caught in the same land cost pinch. Rent control, however, complicates the picture. Builders detect a slack in the luxury market and are now aware of a need for cheaper accommodations. "The big demand is in the $50 to $55 per room bracket," one says. "We all sense it—we know it exists." But there was little done about it, except under urban renewal, until FHA raised its section 207 mortgage limits to cover this market.

This move and the easing of money have helped swamp the FHA office. "There's never been a time when we have had this much activity," a processing official exclaims.

Where land is not so costly, in-town apartment building thrives. Atlanta, Houston and Dallas are good examples of this. Of course, special factors are at work. "Dallas is just now becoming an apartment town," says Glenn Justice of Glenn Justice Mortgage Co., Dallas. "It's a normal trend. People want to live where transportation is good. Also, the apartments sometimes offer swimming pools, central air conditioning and beautiful landscaping." The city is growing fast and "people have to go too far out to buy a home now," he says. However, a mortgage official of an insurance company says 100% loans for apartments are leading to "reckless overbuilding in Dallas."

New industry is bringing a larger population of transient junior executives to the three cities. They stay one or two years and are a natural group for apartments in town. They are an important factor in the rising demand for multiple-unit housing, which has reached boom proportions in Houston.

Shortage of adequate land sometimes works in favor of multi-unit construction. In several cities the need to build vertically was cited to explain the rise in apartment activity. Denver's situation is complicated by a problem of water supply. A local mass homebuilder, M. T. Frederics, says "There just isn't enough land with assured water supply for the large-scale developments." He plans to build an 11-story structure next.

But some doubts about future apartment construction in Denver are expressed. An executive of one of the state's major mortgage companies says, "There's a question whether there will be an increase in the next 12 months. It's possible we are nearing the point where the demand is about to be met."

• **Overbuilding a threat**—The mushrooming of apartments can easily lead to excess, especially on the fast-growing West Coast. An expanding, mobile population always means a high vacancy rate, but the West's rate is moving up ominously. It edged from 6.8% to 7.6% over this year's first and second quarters. The national average was 6% in the second quarter (U.S. Census Bureau; rental housing supply only).

"I don't think overbuilding of apartments is possible" in water-locked San Francisco, a broker says. The trend is still into the city and the only direction left to build is upward. But in roomy Oakland, an owner's group estimates vacancy at 8½% to 10%.

Lenders and builders feel the situation in Los Angeles County is unhealthy too. Construction of dwelling units was running about 4% ahead of population growth at mid-year, officials estimate. The vacancy rate at the same time exceeded 10% for unfurnished apartments, 8% for furnished. Some sectors of San Fernando Valley report a 25% rate.

Some of the same warning signs have appeared in Portland and San Diego. The only non-western city to report danger of overbuilding was Milwaukee.

"Buy American" Federal Ban Coming?

States invoking bans on foreign-made materials in their federal-aid highway programs may soon find themselves tangling with both the White House and the Bureau of Public Roads. Fourteen states now have some form of "Buy American" policy. The latest addition to the list is Utah, which last week invoked a restrictive clause for roadbuilding.

The "Buy American" controversy first bloomed in Texas after the State Highway Department prohibited the use of foreign materials in all roadbuilding. But Highway Administrator Bertram D. Tallamy, said the BPR would not approve the policy for federal-aid highways. He added that the decision was not a blanket ruling (ENR July 31, p. 6).

Mr. Tallamy then ordered his legal staff to investigate the entire "Buy American" issue. The report is completed and reportedly recommends that all state restrictions against foreign materials be eliminated. Such action is sure to bring howls of protest from the states. According to BPR, nine states have some type of restriction on foreign materials. They are: Arizona, Arkansas, Colorado, Oklahoma, Georgia, Washington, New York, California and Pennsylvania. However, ENR found the policy also in effect in North Dakota, Louisiana, Maryland and Mississippi. In addition, Idaho has a restrictive policy on a stand-by basis (ENR Sept. 18, p. 187).

• **Varied patterns**—The hold-down on foreign materials varies with each state. Some have only minor restrictions, but others, such as California, bar foreign materials entirely. Primarily, imported steel and cement cause the fuss. Reinforcing steel from Belgium and Germany appears to be the chief whipping boy.

Utah's new ruling runs across-the-board. The State Roads Commission now will require the following provision in all bids:

"The contractor agrees to use only such manufactured materials as have been produced in the United States; and further agrees that such manufactured materials have been made substantially from materials produced in the United States, provided that when materials so produced cannot be found which meet the specifications required for this construction, the Director of Highways may grant special permission to use items or materials from other sources."

• **Passing the buck**—Telling states they can't make exclusive use of American-made materials for roadbuilding won't be easy. Chances are BPR will not spearhead the issue. Some Washington observers expect such a decree will come from the White House—when and if it does. Reason: "Buy American" clauses include all types of federal-aid construction, not just highways.

Other issues are involved. One is whether the federal government will be invading individual state's rights by such an order. Another is whether a state is tampering with federal powers on foreign commerce and foreign relations when it independently proclaims a boycott on foreign goods. There is also the question of whether restrictive action by an individual state is adding to the overall burden of taxpayers by banning materials that might be cheaper.

Part of the problem stems from producers in foreign nations. Through their embassies, they ask the State Department how they can do business in the U. S. under the various reciprocal trade programs if states prohibit the use of their products.

It is agreed in Washington that BPR and the Administration are faced with a knotty problem. A decision is sure to bring strong protests from both sides. However, betting in Washington is the foreign manufacturers will win.

Commercial Work Heads Higher

Commercial building volume this year will be better than the 1% rise predicted earlier this year (ENR Aug. 7, p. 21). The first eight months of this year brought a $1.36 billion total, up 12% over last year. Outlook for the full year is that contracts will total $1.78 billion, instead of the $1.75 billion first predicted.

Four of the six regions scored gains ranging from 0.4% to 85%. New England dropped 18% and the region west of the Mississippi dropped 6%.

Shopping centers and store construction helped build this strength. The chains have big plans and mean business. Their eyes are on long-term population growth, especially in the 1960s. The easier money market early this year helped, and the improvement in the economy should help further.

• **New patterns**—The chains have followed population movements. They are building stores, warehouses and distribution centers to handle the demand in the steadily expanding suburbs. They're also being enlarged or built big to get more sales per employee.

Some examples in the food field: Food Fair Stores, Inc., plans to build 100 new supermarkets within the next two years. Twenty-two will be in Florida at a cost of $14 million. Food Fair Properties, Inc., an affiliate, plans to expand five or six new shopping centers in Florida at a cost of $11 million.

In general merchandising, Montgomery Ward has a five-year expansion program. The company earmarked $84 million for growth last year.

This year, Chain Store Age's annual survey on planned expansion found that 9,350 new stores would be built in 1958 at a cost of over $1.3 billion. Some 4,275 are slated for shopping centers. This would increase the number of stores by 7% (38% in shopping centers) and dollar expenditures by 12%.

In addition, these chains expect to remodel 11,550 stores, the magazine found. This is a reduction of 12% from last year. So, the emphasis is on new units.

Worthington Corporation Clips Its Own Wings

The 73-year-old trademark of Worthington Corporation was changed this week. The new symbol (bottom) is redesigned along more contemporary lines and the familiar wings have been eliminated in the process.

The company manufactures air conditioning units, rotary compressors, pumps and major components for power generating installations.

Teamster Chief Bids for Freedom

James R. Hoffa, provisional president of the International Brotherhood of Teamsters, is taking the offensive for the first time in a move to cut the strings that have tied his hands as teamster chief for nearly a year.

In a bold bid for freedom, he plans to hold a special teamster convention next February. The object, of course, is his re-election as president in fact as well as in name. This event also would dissolve a court-appointed board of monitors that now sits as a clean-up body inside the teamsters union.

The answer to Mr. Hoffa's new move lies in the hands of federal court Judge F. Dickinson Letts, who set up the board of monitors in the first place. He did so last January in a consent decree between the teamsters and 13 rank-and-file teamster members who held up Mr. Hoffa's ascension to the presidency by challenging the legality of the election.

Judge Letts' decision marks the last major hurdle between Mr. Hoffa and achievement of his big goal.

The teamster leader has just emerged relatively undamaged from a seven-week probe into his affairs by the Senate's McClellan committee.

Jimmy Hoffa's call for an election left . . .

Judge F. Dickinson Letts holding the bag.

• **Riding high**—It was a revitalized Hoffa who moved for a new teamster convention. The announced plans for a February election came near the tail end of the McClellan investigations when it became clear there were no new surprises waiting—all the evidence was in and while it might be embarrassing it wasn't going to do concrete damage.

The committee and its general counsel, Robert F. Kennedy, wound up two months of business in obvious frustration. In a last salvo, the committee released a series of charges against the Hoffa teamster stewardship on racket associations and mishandling of union funds, but the anti-Hoffa battle had been lost.

Why did the Senate investigation fizzle? Here's what many in union circles are now saying: "Hoffa's either basically honest or he's very, very clever. Seldom has anyone been investigated so thoroughly—and no one's been able to pin anything very damaging on him yet."

With the committee hearing behind him, the stocky labor leader now faces only the board of monitors. He hardly disguises his desire to get rid of the monitors, but they are showing a definite reluctance to leave, and are resisting the convention call.

• **The hurdle**—Judge Letts' initial decree says the monitors are to serve for one year, after which a special teamster election might be called to elect a president and end the monitorship. But this move hinges on two factors:

• Is the teamster clean-up far enough along to permit the step?

• Would the convention be operated under democratic procedures that permit a free election?

On these two points, Mr. Hoffa and a majority of the monitors sharply disagree. The monitor stand by chairman Martin F. O'Donoghue and Godfrey Schmidt is that the teamsters, far from improving, are in fact resisting their clean-up demands. The third monitor, teamster attorney L. N. D. Wells, dissents from this position.

The Hoffa forces argue that they have followed most orders from the monitors and, besides, they have their own public watchdog group to police the union. (Recently, the teamsters appointed a three-man public board headed by ex-Senator Georfe Bender (R., Ohio)—as a house-cleaning unit—a move resisted by the court monitors and the McClellan committee as something of an attempted whitewash)

It will be up to Judge Letts to determine the teamsters' right to a convention after the minimum year. If he allows Mr. Hoffa to proceed, the convention would be held without the rules laid out by the monitors for democratic selection of the delegates who would pick the new president, and without action from the teamsters on a number of other monitor orders.

Among these are a demand that the union suspend Owen Bert Brennan, Detroit teamster leader and Hoffa ally, pending a union trial on corruption charges. Other Hoffa allies are targets of the O'Donoghue board. And, Mr. Hoffa himself is under monitor review as a result of some 140 charges from a rank-and-file teamster group.

The monitors are seeking an additional ruling from Judge Letts. They want authority to force their demands on the teamsters. So far they have been proceeding as an advisory agency without any real authority.

Mr. Hoffa has a definite purpose in moving for a February convention. Despite the McClellan committee's charges that 52% of the first vote for Mr. Hoffa as president was illegal under the constitution, he feels he can repeat his victory. He's currently riding high once again—a situation that could be temporary—and he wants to cement his position as teamster president while the time is ripe.

If Mr. Hoffa succeeds, the AFL-CIO attempt to undermine him from within will have failed. And the union will be free to take the offensive on plans held in abeyance during the long parade of challenges to Mr. Hoffa's stewardship. Among those plans are these:

• With employers, Mr. Hoffa plans to move into more pattern bargaining.

This means more negotiating authority will be placed in the hands of his international union.

• Within labor, the teamsters will no longer be meek and conciliatory toward those AFL-CIO unions that persist in treating the trucking union as a corrupt outcast. In such areas as the Four-Way Heavy and Highway Construction Pact with the operating engineers, laborers and carpenters, the teamsters, for example, would resist any new AFL-CIO efforts to curb its operations. And this would precipitate the final showdown the AFL-CIO has so far been able to avoid.

Open-Shop Setback for Unions

Federal court curbs centralized union activity in labor efforts to organize nonunion construction workers

The Fourth Circuit Court of Appeals last week handed down a decision that deals a crippling blow to building trades efforts to organize nonunion construction workers.

The ruling concerned a buikding and construction trades council that was instrumental in setting up a program to promote the principle that union men won't work with nonunion men on the same job. The council was held responsible for the unfair labor practices that followed because of its indirect participation in the program.

The result is that the decision may effectively clip the wings of local building trades councils in attempting to coordinate or to supervise the organizational activities of local unions. This may make life easier for nonunion contractors but it's bad news to unions in an industry where traditional methods of organizing don't apply.

The ruling is the latest development in a long-standing feud between AFL-CIO building trades unions and open-shop contractors in Baltimore.

• **The problem**—The present decision stems from litigation that began with a 1955 strike against Selby-Battersby & Co., then a subcontractor for an open-shop general contractor. But the issue arose a year before when the Baltimore construction unions, under the leadership of the Baltimore Building and Construction Trades Council, began working on a new approach to curb open-shop activities. At that time, the open-shop situation was viewed as detrimental to union growth and to labor peace.

The upshot of this activity was formation of a union-contractor Joint Conference Board and the drafting of a standard labor agreement that many of the local contractors signed. Under that agreement, participating contractors were assured of a labor supply only if they dealt exclusively with union contractors.

The 1955 strike occurred when Selby Battersby refused to sign the agreement.

A National Labor Relations Board case, resting primarily on the secondary boycott provisions of the law, was started against the local unions and the council. The locals entered into a settlement agreement and the NLRB eventually dismissed the charges against the council on the grounds it wasn't responsible for the acts of affiliated locals.

• **Court's view**—Now, the Circuit Court has reversed that dismissal. It said the instigator of wrongful conduct is responsible for the consequences of that conduct.

The peg on which the responsibility was hung was the dual capacity in which some of the plan's promoters worked.

Although the council—headed by Frank Ellis—helped to get the attack against open-shop contractors started, it did not participate in the drafting or supervision of the plan. However, Mr. Ellis and several other council members did participate as business agents of their local unions and were alternate members of the Joint Board.

The court concluded that the council had retained its responsibility for the organizational activities despite the creation of the Joint Board and had sought to discharge that responsibility through its president.

The court saw "no reason to suppose" that in requesting assistance in the planning campaign the council had in mind anything other than the "wrongful conduct" that followed. And that was "the exertion of pressure on employers" to implement the principle that union men will not work with nonunion men.

"It is enough," the court said, "that the council instigated the course of events which proceeded for the benefit of the council, to the climax which was contemplated from the beginning, and it took no action to disavow or disassociate itself from the actions of the man who held the office of president."

Unions Seek to Increase Membership in Hawaii

Hawaii's biggest construction firms may be about to sign their first collective bargaining agreements with the building trades unions.

Earlier this month, Richard J. Gray, president of the AFL-CIO Building and Construction Trades Department, went to Hawaii in an effort to promote the organization of construction workers.

After more than a week of talks with little information released, Mr. Gray left for Washington, D.C. But he signed a joint statement with the contractors saying he would return in November for further talks.

Better union organization in the booming Hawaiian construction industry has long been an AFL-CIO objective. Hawaiian firms now employ 12,000 workers and are moving at a pace close to $200 million a year.

Current Hawaiian wage scales, set unilaterally by the General Contractors Association, run well below West Coast scales.

Much of the contractor resistance to unionization reportedly stems from the presence of a teamster—Arthur A. Rutledge—as president of the Hawaiian Building Trades Council. One labor source indicated this might be overcome in one of two ways—by his removal from office under national AFL-CIO policy or by turning over construction hauling jobs to members of the operating engineers union.

Canadian Contractors Ask For New Curbs on Labor

The Canadian Construction Association has submitted a brief to the office of Labor Minister Michael Starr urging legislative curbs on a variety of labor union activities.

The brief has a familiar ring to those who have observed the defeat of the Kennedy-Ives labor bill in the U.S. Congress.

It calls for outlawing of jurisdictional strikes, secondary boycotts, organizational strikes or picketing and the refusal to cross picket lines.

The brief was submitted in response to Mr. Starr's request to a number of organizations for "considered suggestions" for improving the federal labor code.

The Canadian Labor Congress, Canadian and Catholic Confederation of Labor, the Canadian Manufacturers Association and the Canadian Chamber of Commerce were invited to submit their views.

OFFICIAL PROPOSALS

Bids: October 7, 1958

City of East Chicago, Indiana

ADVERTISEMENT FOR BIDS

The Board of Sanitary Commissioners of East Chicago, Indiana, will receive and publicly open sealed Proposals for the construction of certain Sewage Treatment Plant Additions, Storm Water Pumping Stations and Sewers until 10:00 A.M. (Central Standard Time) on the 7th day of October, 1958, at the office of the East Chicago Waterworks Department, 4733 Olcott Street, Second Floor, East Chicago, Indiana. The contract documents, including plans and specifications, are on file and available for inspection at the office of the Board of Sanitary Commissioners of the City of East Chicago, Indiana, at 5200 Indianapolis Blvd., East Chicago, Indiana.

Copies of documents, including plans and specifications, required for review or bidding purposes may be obtained only from the Board of Sanitary Commissioners by depositing $75.00 for proposed Division A—Sewage Treatment Plant Additions, $60.00 for Division B—Storm Water Pumping Stations, and $50.00 for Division C—Sanitary Relief Sewers and Force Mains, for each set so obtained.

The full amount of the deposit for one set of documents and one-half of the deposit for any additional sets of documents will be refunded to each bidder who submits a formal proposal to the Board of Sanitary Commissioners, and who also returns the plans (and specifications on additional sets) in good condition to the Board of Sanitary Commissioners within ten (10) days after his bid security has been returned to him. Equipment manufacturers, subcontractors, and others who do not submit formal proposals to the Board of Sanitary Commissioners will be refunded one-half (½) the amount of the deposit for all sets of complete documents, including plans and specifications, returned in good condition to the Board of Sanitary Commissioners within ten (10) days after the opening of bids.

A certified check drawn on a solvent bank in the State of Indiana, payable without condition to the Board of Sanitary Commissioners of East Chicago, Indiana, in an amount not less than five percent (5%) of the bid shall be submitted with each Proposal.

The Board of Sanitary Commissioners of East Chicago, Indiana, proposes to complete financing arrangements for this improvement within a period of one hundred twenty (120) days after construction bids are received. The bid securities of all bidders, except the security submitted with the lowest acceptable bid, will be returned within a fifteen (15) day period following the time of receipt of the bids. The bid security of the lowest acceptable proposal will be returned on request after the Board of Sanitary Commissioners has made a conditional award to the successful bidder, if a satisfactory Performance Bond has been delivered to the Board of Sanitary Commissioners and a tentative contract executed. The conditional award will not be in effect until the Board of Sanitary Commissioners has been successful in raising the required funds for payment of construction. Provided it proves impossible to raise the required funds, the conditional award will be canceled by the Board of Sanitary Commissioners and said Board shall not then be liable for any payments whatsoever to the Contractor. Extension of time beyond the one hundred twenty (120) day period of the conditional award may be made only by mutual agreement between the Board of Sanitary Commissioners, the Contractor, and the Contractor's Surety.

The successful bidder will be required to furnish a satisfactory Performance Bond in the sum of the full amount of the contract (or contracts).

In general, the improvement on which Proposals are requested will require the following construction:

DIVISION A—Sewage Treatment Plant Additions:

The construction of additions to the existing City-owned sewage treatment plant. The proposed construction includes a new administration building, three (3) sludge digesters including control building, the installation of an engine-driven blower including accessories, remodeling work of existing main equipment building and miscellaneous outside improvements. The proposed contract includes the furnishing of all labor, materials and equipment for a complete operating installation.

DIVISION B—Storm Water Pumping Stations:

The construction of two new storm water pumping stations, one located at 151st Street and Magoun Avenue with a capacity of 169 M. G. D., and the other located at Sheridan Place and Michigan Avenue with a capacity of 210 M. G. D. and the installation of screening and bypass facilities, and one 50 M. G. D. storm water pump at the existing Alder Street Pumping Station. The proposed contract includes the furnishing of all labor, materials and equipment for complete operating installations.

DIVISION C—Sanitary Relief Sewers and Force Mains:

Furnishing and installing approximately 43,870 feet of 24" to 84" reinforced concrete sewers, 5,125 feet of 72" concrete pressure pipe force main, 1,050 feet of 14" cast iron pipe force main, 1,380 feet of 14" cast iron pipe river crossing force main, 4,580 feet of 8" to 18" vitrified clay pipe sewers, relining 6,100 feet of 72" to 96" brick sewer, and manholes, special chambers and appurtenances. Division C is divided into five sections and contracts may be awarded on any one or combination of sections.

Alternate Proposals are solicited on Major Items of Equipment as supplied by several manufacturers.

Plans and specifications for this project were prepared by Consoer, Townsend and Associates, Consulting Engineers, 360 East Grand Avenue, Chicago 11, Illinois.

Dated at East Chicago, Indiana
this 11th day of September, 1958.

BOARD OF SANITARY
COMMISSIONERS OF EAST
CHICAGO, INDIANA
By: Wm. E. Slagley
Secretary

Bids: October 16, 1958

Commonwealth of Pennsylvania Department of Mines and Mineral Industries Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Department of Mines and Mineral Industries, Main Capitol Building, Harrisburg, Pennsylvania, until 11:00 A.M. Eastern Daylight Saving Time, the 16th October, 1958, at which time and place they will be opened publicly and read aloud, for the following:

Furnishing all labor, equipment and materials to install two (2) deepwell pumps, motors, power substation and control as purchased and furnished under Flood Control Project No. 5, Phase "A", and also to supply and install structural steel, fence, discharge piping, fittings, grading material, pole line, concrete and other materials, and to remove certain structures and materials now installed.

Location of the project—Greenwood No. 10 Shaft, Greenwood Colliery, Lehigh Coal and Navigation Company, Coaldale Borough, Schuylkill County, Pennsylvania.

This project is one to the cost of which the United States Government may contribute under Public Law 162, 84th Congress (69 Stat. 352) and is subject to the terms of that Law, as well as to Act No. 82, July 7, 1955, Commonwealth of Pennsylvania, and to the "Procedures for Administration of the Act of July 15, 1955, to provide for the Conservation of Anthracite Coal Resources Through Measures for Flood Control and Anthracite Mine Drainage, (Public Law 162, 84th Congress, 69 Stat. 352)," and to the State-Federal Contribution Contract for Flood Control Contract No. 5, Phase "B". The Commonwealth's acceptance of and liability arising out of any bid shall be subject to contribution by the United States Government under the provisions of said Contribution Contract.

Prospective bidders may obtain Specifications, Proposal Form and Contract from Deputy Secretary, Department of Mines and Mineral Industries, Anthracite Institute Building, 237 Old River Road, Wilkes-Barre, Pennsylvania, upon request.

Joseph T. Kennedy
Secretary of Mines and Mineral Industries

Bids: October 15, 1958

Central Eletrica De Furnas S/A—BRASIL

Notice to Water Wheel Generator Manufacturers

Applications for prequalification of Bidders for the manufacture and delivery of synchronous generators designed for coupling to vertical Francis hydraulic turbines will be received at the main offices of Central Eletrica de Furnas S/A (FURNAS), Rua São José 90—3° andar, Rio de Janeiro, Brasil, not later than 12.00, noon, October 15th, 1958.

Manufacturers are cautioned to use first-class airmail for remittance of applications, and not parcel post as it involves considerable delay in delivery.

Tenders will cover the first stage (4 units totalling 640,000 KVA) of the Furnas hydro-electric development on the Rio Grande, near the town of Passos, State of Minas Gerais, Brasil. Operation of the first unit is required early in 1962, and of subsequent units at about three-month intervals. The Furnas Development will have an ultimate installed capacity of 1 100 000 kw in 8 units.

Applicants for prequalification must submit adequate information on at least the following items.

1. Manufacturing experience on large, slow speed water wheel generators.
2. Orders in hand and scheduled deliveries up to 1962.
3. Research, design and testing facilities for rotating machinery.
4. Research, design and analog or digital computers available for EHV transmission problems as related to alternating current generator design.
5. Available shop space and facilities, including size limitations of main machine tools.
6. Probable delivery schedule for the first and subsequent units starting from date of signature of contract.

FURNAS will only consider tenders submitted by the manufacturers selected among applicants at its sole discretion and judgment. Negotiations with FURNAS shall be held directly by the manufacturer's head offices or through branch offices or subsidiaries in Brasil. FURNAS will not deal with intermediaries or agents.

Invitations for tenders will be issued in November 1958, for submittal by the Bidder by February 1958. Placing of the order with the successful bidder is scheduled for about April 1959.

Bids: October 2, 1958

Soil Explorations and Foundations Investigation

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m. Advanced Eastern Standard Time on October 2, 1958, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON BRUCKNER EXPRESSWAY SECTION 2, F. A. I. ROUTE 511 AND 516, CASTLE HILL AVENUE TO NEW ENGLAND THRUWAY, PROJECT 1-1068 (15), BRONX COUNTY, WHICH CONSTITUTES CONTRACT SPEC. NO. FA-SM-130.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.
(b) Mr. M. E. Goul, District Engineer, New York State Department of Public Works, 325 West Main Street, Babylon, Long Island, New York.
(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit.

The Engineer's Estimate of cost for this work is $49,737.50.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $2,500.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPERINTENDENT OF
PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: October 9, 1958.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 9th day of October 1958, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following Projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimate Cost of Work
DISTRICT No. 1, G. L. Nickerson, District Engineer, 353 Broadway, Albany, New York						
Essex (Rte. 28N)	FARC 58-141	Aiden Lair-Newcomb Pt. 1, S.H. 5187 Project No. S-210(4)	0.67	Asphalt Concrete	$9,000 Plans $5	$166,000
Saratoga (Rte. 67)	FARC 58-131 (Postponed from Sept. 18, 1958 Letting)	Ballston Spa-Scotch Church Pts. 1 & 2 S.H. 5334-5542, Project DS-382(2)	5.21	Asph. Conc. = 5.15 Mi. Misc. Work = 0.06 Mi. Reinf. Conc. Box Br. 20'	$50,000 Plans $5	892,000
Saratoga	FASS 58-14	Stafford Bridge-Gilberts Corners, C.R. 65 Project S-533(1)	2.40	Asph. Conc. = 2.36 Mi. Misc. Work = 0.04 Mi.	$11,000 Plans $5	205,000
Saratoga (Rte. 9)	FARC 58-143	Clifton Park-Crescent Pt. 1, S.H. 8065 Clifton Park-Round Lake, S.H. 1795, Project F-639(11)	2.24	Asph. Conc. = 2.13 Mi. Misc. Work = 0.11 Mi.	$35,000 Plans $5	648,000
DISTRICT No. 2, Lacy Ketchum, District Engineer, 109 No. Genesee Street, Utica 1, New York						
Fulton & Hamilton (Rte. 30)	FARC 58-139	Northville Village, North S.H. 5065, County Line-Hope Center, S.H. 5038 Hope Center-Wells, Pt. 1, S.H. 5133, Project F-1036(3)	5.23	Asphalt Concrete 2 Brs. Prestressed Conc. 204' and 297.5'	$93,000 Full Size Only $25	1,688,000
DISTRICT No. 3, Earle E. Towlson, Acting District Engineer, 333 E. Washington Street, Syracuse, New York						
Wayne	FASS 58-15	East Penfield-Walworth, Pt. 2, Co. Rd. 138 Project S-322(2)	5.31	Bit. Double Surf. Treated Stone	$35,000 Plans $5	677,000
DISTRICT No. 4, B. F. Perry, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Monroe	FATS 58-1	Rochester City: Inner Loop (South Ave. to George St.) Project DU-231(12)	0.53	Furnish and Install Traffic Signs	$1,000 Plans $5	18,000
Monroe	LOSP 58-3	Lake Ontario State Parkway Sects. A, B, C and D	....	Furnish and Erect 22,440 Feet of Aluminum Chain Link Fencing	$4,000 Plans $5	76,000
Monroe	FASS 58-13	Beahan Road (County Road) Project S-526(1)	1.68	Asphalt Concrete	$21,000 Plans $5	391,000
Monroe	FASS 58-16	Lake Road-East Fork (County Road), Project S-309(1)	0.26	Bit. Mac. Ty. 1 = 0.23 Mi. Misc. Work = 0.03 Mi. Prestressed Conc. Beam Br. 121.5'	$6,200 Plans $5	111,000
Ontario (Rtes. 14 & 96)	FATS 58-2	Geneva-Lyons, Pt. 2, S.H. 5252, Phelps-Junius Pt. 1, S.H. 5437, West Junius-Waterloo, Pt. 1, S.H. 8056, Project DF-1013(4)	3.03	Furnish and Install Traffic Signs	$1,100 Plans $5	20,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Cattaraugus & Chautauqua (Rte. 322)	FARC 58-137 FASSH 58-13	Fredonia-South Dayton Pt. 3, S.H. 1381 Fredonia-South Dayton Pt. 4, Project S-510(1)	0.55	Asph. Conc. = 0.54 Mi. Misc. Work = 0.01 Mi. Comp. I-Beam Br. 140'	$16,000 Plans $5	285,000
Chautauqua	FIET 58-1	Interstate Route 504 (N. Y. State Thruway—Erie Sect.—Sub. E-1A) Shortman Road Ramps Project I-1072(5)	0.83	Asph. Conc. = 0.71 Mi. Misc. Work = 0.12 Mi.	$8,000 Plans $5	149,000
Erie (Rte. 20A)	RC 58-147	Orchard Park-East Aurora, S.H. 1066	0.88	Roadside Development	$160 Plans $5	3,000
Erie (Rte. 20A)	RC 58-148	Big Tree, S.H. 86 (Br. No. 2)	....	Clean. and Paint. One Bridge	$275 Plans $5	5,000
DISTRICT No. 6, James H. Thomas, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Allegany, Chemung, Steuben, Schuyler, Tioga & Yates	RC 58-142	Fifteen Various State Highways on Rtes. Nos. 21, 244, 408, 13, 228, 227, 21, 53, 79 and 54A	54.00	Subsealing Cement Concrete Pavement	$15,000 Plans $5	277,000
DISTRICT No. 7, Robert W. Sweet, District Engineer, 444 Van Duzee Street, Watertown, New York						
Franklin (Rte. 95)	FARC 58-140	Hogansburg-Bombay, S.H. 820, Project S-499(1)	4.58	Asph. Conc. = 4.56 Mi. Misc. Work = 0.02 Mi.	$35,000 Plans $5	665,000
St. Lawrence (Rte. 37)	FATC 58-2	Village of Massena, Center St.-Parker St. Bridge and Interchange, FASSH 57-5 Project DUS-467(2)	0.64	Furnish and Install Traffic Signals	$2,000 Plans $5	38,000
DISTRICT No. 8, Kurt G. Rauer, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Dutchess (Rtes. 22 & 55)	FARC 58-138	Dover Plains-Pawling Town Line, Pt. 2, S.H. 5326 Project DS-542(1); DF-350(22)	2.69	Asphalt Concrete	$25,000 Plans $5	432,000
Ulster (Rte. 9W)	FARC 58-107	East Chester Street Extension, S.H. 9360, Project DF-857(3)	1.44	Asphalt Concrete	$14,000 Plans $5	250,000
DISTRICT No. 9, Joseph C. Frederick, District Engineer, 71 Frederick Street, Binghamton, New York						
Broome	FISH 58-12	Interstate Route 505, Penn. State Line, Rte. 17 at Five Mile Point, Cont. 2 (Blakesley Rd. to Trim St.) Project I-1127(8)	2.57 (1.40 Acc.)	Grading & Drainage & Misc. Work = 3.21 Mi. Asph. Conc. = 0.27 Mi. Bit. Mac. Ty. 1 = 0.49 Mi. 2 Hy. Seps. Comp. I-Beams 136.8' & 147.5', 2 Brs. Twin Reinf. Conc. Boxes 30.3' and 27.1'	$140,000 Plans $5	2,510,000
Otsego (Rte. 166)	FASS 58-11	Cherry Valley-Sprout Brook Co. Rd. 19, Project S-519(1)	2.54	Asphalt Concrete	$38,000 Plans $5	688,000
DISTRICT No. 10, M. E. Goul, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Nassau	FALIE 58-1	Long Island Expressway (Guinea Woods Rd. to Post Rd. Cont. 1) Project U-862(14)	2.33 (5.30 Acc.)	9" Col. Cem. Conc. Pavt. 2 @ 37' Wide = 2.16 Mi. Misc. Work = 0.17 Mi. Serv. & Acc. Rds. = 5.03 Mi. Asph. Conc. & 0.27 Mi. Cem. Conc. 4 Hy. Seps. Reinf. Conc. Rig. Fr.: 1 @ 106.8', 2 @ 106.2', 1 @ 78'	$333,000 Plans $5	6,130,000
Nassau	FALIE 58-2	Long Island Expressway (Post Rd. to Jericho Tpke. Cont. 2) Project U-862(15)	2.20 (5.08 Acc.)	9" Col. Cem. Conc. Pavt. 2 @ 37' Wide = 2.11 Mi. Misc. Work = 0.09 Mi. (Cem. Conc. Pavt. = 1.51 Mi. and Asph. Conc. = 3.57 Mi. Acc.) 2 Hy. Seps. Rig. Fr. 106' and 106.3' 2 Hy. Seps. Comp. Alum. Plate Girders 76.8' Each	$333,000 Plans $5	6,055,000
Suffolk	SSP 58-3	Southern State Parkway Cont. 13	1.94 (1.82 Acc.)	9" Col. Cem. Conc. Pavt. 2 @ 37' Wide = 1.24 (+½ of 0.66) Mi. Asphalt Concrete = ½ of 0.66 Mi. Misc. Work = 0.04 Mi. (Acc. Roads and Ramps = 1.82 Mi.) Hy. Sep. 2 Rigid Frames 61' Each With Service Stations R.R. Sep. 2 Steel Girders 67.9' and 55.2' Hy. Sep. Rigid Frame 69' Plus Widen Exist. Struct. Hy. Sep. Rigid Frame 61'	$200,000 Plans $10	3,644,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal. Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: October 1, 1958

City of Binghamton, New York
Sewage Treatment Plant

NOTICE IS HEREBY GIVEN that sealed Proposals will be received by the Board of Contract and Supply for:

CONTRACT NO. 2	PLUMBING WORK
CONTRACT NO. 3	HEATING AND VENTILATING WORK
CONTRACT NO. 4	ELECTRICAL WORK

(NOTE: The General Construction of the Sewage Treatment Plant is provided separately under Contract No. 1; however, the applicable parts of Contract No. 1 for excavation and concrete work have been incorporated by reference in Contracts Nos. 2, 3 and 4.)

The work to be done under Contracts Nos. 2, 3 and 4 includes the following principal features:

Contract No. 2—Plumbing Work: This Contract provides for furnishing and installing plumbing systems in the Headhouse, the Grit Washing and Chlorinator House, and the Sludge Control Building.

Contract No. 3—Heating and Ventilating Work: This Contract provides for:

(a) Complete heating systems in the Headhouse, the Grit Washing and Chlorinator House, and the Sludge Control Building.

(b) Mechanical ventilation in various rooms and buildings, and combustion air supply for boiler room.

Contract No. 4—Electrical Work: This Contract provides for:

(a) Complete electrical switching, distribution, control and indicating systems for outdoor unit substation, motors, indoor lighting, outside lighting and flood lighting, grounding, and remote indicating and alarm systems.

(b) Installing, testing and placing in service of certain equipment and devices furnished under Contracts Nos. 1, 2 and 3.

Sealed bids for the above described work will be received by the office of the Board of Contract and Supply, in the Council Chambers, City Hall, Binghamton, New York until 10:30 A.M. (EDST) on Wednesday, October 1, 1958, at which time and place said proposals will be opened and read aloud.

BIDDERS MAY BID ON ANY OR ALL CONTRACTS

Drawings, Specifications, Instructions to Bidders, Proposal and forms of Proposal Bond, Contract and Performance Bond may be examined at the office of the Board of Contract and Supply, City Hall, Binghamton, and at the office of Parsons, Brinckerhoff, Hall & Macdonald, Engineers, Sanitary Department, Room 602, 55 Broadway, New York, New York. Copies may be obtained at the office of Parsons, Brinckerhoff, Hall & Macdonald, Engineers and at the office of the Board of Contract and Supply upon deposit of twenty-five dollars, which sum will be refunded upon return of the Drawings and Specifications in good condition within sixty (60) days after the opening of Bids.

The Drawings and Specifications for Contract No. 1, General Construction, may also be examined at the above offices for reference, and copies obtained upon deposit of twenty-five dollars, which will also be refunded upon their return in good condition within sixty (60) days after the opening of bids.

Proposals must be submitted on the Form furnished by the City and shall be accompanied by a Bid Security in the form of an acceptable proposal bond or a certified check in an amount not less than five percent (5%) of the total bid. Said deposit will be held by the City subject to the requirements set forth in the Information for Bidders.

The successful Bidder will be required to furnish a satisfactory Performance Bond in the amount of One Hundred per cent (100%) of the accepted bid.

The Board of Contract and Supply reserves the right to reject any or all bids and to waive any informalities therein.

William Emmons
Board of Contract & Supply
City of Binghamton

By: William Emmons, Secretary

Dated Sept. 3, 1958

OFFICIAL PROPOSALS

Bids: October 9, 1958.

Contract B.P. 58-70

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Public Building Law and Highway Law, sealed proposals will be received, until 10:30 A.M., D.S.T., October 9, 1958, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

Contract B.P. 58-70 for
Beach Protection (Artificial
Beach Nourishment) at Point O'Woods,
Town of Brookhaven, Suffolk County,
New York

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Gov. Alfred E. Smith State Office Bldg., Albany, New York.

(b) Department of Public Works, 270 Broadway, New York City, New York.

(c) In addition to the above mentioned offices, plans, maps and specifications for Contract B.P. 58-70 may be examined and obtained at the office of Mr. Milton E. Goul, 325 West Main St., Babylon, L. I., New York.

The deposit for Plans and Proposal Forms for Contract B.P. 58-70 is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's Estimate of Cost for Contract B.P. 58-70 is $64,000.00.

Proposals for Contract B.P. 58-70 must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the State of New York, Commissioner of Taxation and Finance for the sum of $3,500.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Public Building Law and to the Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: October 14, 1958

Commonwealth of Puerto Rico
Department of Public Works
Bureau of Highways

PROJECT F-2-4 (5) "DE HOSTOS" AVENUE
(MAYAGUEZ TERRACE—CRISTY STREET SECTION)
MUNICIPALITY OF MAYAGUEZ, P. R.
ADVERTISEMENT
August 25, 1958

The Board of Awards of the Department of Public Works of Puerto Rico, 1507 Ponce de León Avenue, Santurce, Puerto Rico, will receive sealed proposals for the construction of 2.506 Kms. of Project F-2-4 (5) "DE HOSTOS" AVENUE (Mayaguez Terrace-Cristy Street Section), State Road No. 2 Municipality of Mayaguez, Puerto Rico.

Bidders shall submit their proposals at the office of the Board of Awards, 1507 Ponce de León Avenue, Santurce, Puerto Rico until 2:00 P.M. (Puerto Rico time) October 14, 1958 at which time and place said proposals will be publicly opened and read aloud.

Principal items are 110,265 CuM Selected Borrow Material; 100,100 LnFt Vertical Sand Drains; 3,153 CuM Class "A" Concrete; 30,635 LnFt Cast-in-place Concrete Piles or 28,188 LnFt Structural Steel Piles and 109 Each 100 Feet Precast Post-tensioned Bridge Girders.

Plans, specifications, instructions to bidders, and all necessary information may be obtained from the office of the Procurement and Contract Division, Department of Public Works, 1507 Ponce de León Avenue, Santurce, Puerto Rico upon a deposit of ONE HUNDRED TWENTY FIVE DOLLARS ($125.00) in cash, money order or certified check payable to the Secretary of the Treasury of Puerto Rico until 96 hours prior to the opening of bids. The full amount of the deposit will be refunded to each depositor upon the return of the plans in good condition within (20) days after the opening of bids.

Each proposal must be accompanied by a provisional bond in the amount of NINETY THOUSAND DOLLARS ($90,000.00) in any of the terms indicated in the General Conditions.

The Board of Awards reserves the right to accept or reject any or all bids and to award contract under the conditions found most favorable to the Commonwealth of Puerto Rico.

Sgd.
Francisco Lizardi
Acting Secretary of
Public Works

EMPLOYMENT OPPORTUNITIES

ADDRESS BOX NO. REPLIES TO: Box No.
Classified Adv. Div. of this publication.
Send to office nearest you.
NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• *POSITIONS VACANT*

Highway Engineers—Highway Engineers with a minimum of 3 years experience. Excellent opportunity with established consulting engineering firm in Middle West. P-7909, Engineering News-Record.

Engineer-Management. Associate with legal and/or accounting training—development and construction of oil company terminal projects—New York and East Coast areas. P-8716, Engineering News-Record.

Wanted: Top Flight Salesman-Estimator for aggressive, growing steel fabricator. Must know structural steel and construction business. Opportunity for ambitious man to grow with company. Location Michigan. P-8769, Engineering News-Record.

Civil or Arch. Engineering Graduates under 30, aggressive, military completed. For estimating and field engineering. Some background experience desirable. Submit personal resume and recent photograph. Dondlinger & Sons Const. Co., Inc., Box 398, Wichita, Kansas.

Graduate engineers experienced in soils and building materials testing. Thompson & Lichtner Co., 8 Alton Place, Brookline 46, Mass.

• *POSITIONS VACANT*

Superintendent Wanted for road construction. Rieth-Riley Construction Co., Inc., P.O. Box 477, Goshen, Indiana.

Bridge Designers with Interstate experience. Forward complete resume of education and experience with salary requirements to Macomber & Faber, 1824 N. 4th St., Harrisburg, Pa.

Associate Civil Engineers San Francisco Bay Area—$625-$780. Design positions in street and port departments. Promotional opportunities, liberal benefits. B.S. in civil and 3 years experience. Contact Mr. Weaver, Civil Service, Room 100, City Hall, Oakland, California.

Civil Engineer with extensive experience in the design and construction of large capacity water supply projects including pumping stations and intake structures. Send complete resume including salary requirements. P-8804, Engineering News-Record.

Reinforcing Detailer with a minimum of five years experience. Excellent starting salary and usual benefits. Opportunity for advancement. Brocker Mfg. & Supply Co., York, Pennsylvania.

Qualified Reinforcing Steel Estimator required for growing Fabricator. Excellent salary for right man. Brocker Mfg. & Supply Co., York, Pennsylvania.

(Continued on page 116)

DON'T FORGET THE BOX NUMBER

GRADUATE CIVIL or ARCHITECTURAL ENGINEERS

We are looking for a young, recent college graduate, with a degree in either architectural or civil engineering, for a position in our El Paso, Texas—Estimating Department. This position provides a training ground for our future superintendents and executives. It is an excellent opportunity for a young man to obtain a desirable position with a reliable firm doing all types of construction work.

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Man capable of full responsibility for estimating dept. in industrial, commercial, institutional and school construction. Must have highly competitive experience. Reply giving resume of experience and personal data to

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Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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An exclusive association for foreign construction workers. Membership is a must. Current authenticated data on all foreign construction projects. Write for free details.
Overseas, Americans, Inc., 7 West 44 St., New York 36, N. Y. Dept. B.

WANTED

ESTIMATOR and CHIEF ENGINEER

Experienced in estimating all phases of Highway Construction and Bridge Construction with Prominent Contractor in the Philadelphia area. Submit detail experience and educational record.

P-8845, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

CHIEF HIGHWAY ENGINEER

Broad experience required in design, construction and administrative phases. Ability to manage large highway department, in addition to client negotiations and liaison, is paramount.

Frank L. Ehasz
Consulting Engineer
40-29 27th St. L. I. C. 1, N. Y.

Construction Superintendent

Multi-million dollar project. One and a half years construction time. High school education required. College education and/or degree desirable. Construction experience: 10 years supervisory capacity. Apply to:

P-8909, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

SALES ENGINEERS
Sanitary Field

If you're a sales-minded engineer with sanitary experience . . . if you want to practice your profession as a creative individual . . . if challenge, variety, and freedom of action appeal to you . . . you'll be interested in the opportunities for sales engineers in Dorr-Oliver.

Academically, B.S. or M.S. degrees in Civil or Chemical engineering with sanitary option are preferred. Experience with Federal, State or local health agencies or in sanitary consulting or sales work is ideal.

Send resume including salary requirement to R. Farrell.

DORR-OLIVER INCORPORATED
Havemeyer Lane Stamford, Conn.

ESTIMATOR—ENGINEER

Wanted: Experienced Estimator and Construction Engineer capable of managing projects. Location, Southern States. Good opportunity for right man. Salary open. Give full details covering education, experience, references, salary and personal data. All replies confidential. Reply HARRELSON CONSTRUCTION CO., INC., Phenix City, Alabama.

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Career opportunities for individuals interested in professional recognition, ample opportunity for advancement based on merit, plus employee retirement plan, group life insurance, hospitalization, paid vacation and holidays.

Mail Resume To F. W. AHERN, Personnel Director

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Consulting Engineers
Baker Building Phone SPruce 4-3010 Rochester, Penna.

EXECUTIVE

To associate with an established consulting engineering firm for the direction of their Sanitary, Water Supply and Sewage work. This man must be a registered C.E., with 20 years experience in sanitary engineering, and prominent in this field. Important among his duties will be negotiating for new business and the direction of an engineering staff for the production of contract plans. All replies confidential.

P-8820, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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FOR HIGHWAY and BRIDGE WORK
SENIOR and JUNIORS
WORK IN RICHMOND, VA.
Send Resumes to
Blackburn & Blauvelt
3114 West Clay Street Richmond, Va.

• POSITIONS VACANT

(Continued from page 114)

Aggressive Civil Engineer—Age 24 to 30— General Construction estimator with some construction experience—Industrial, commercial, institutional—Opportunities and benefits—Location South East Ohio—Send resume. P-8834, Engineering News-Record.

Cost Estimator—With Heavy Construction Experience. Firm is established but growing, Upstate New York—Municipal Contractor. Desire young ambitious engineer. Salary and future dependent on ability. Furnish resume and references. P-8867, Engineering News-Record.

Water Treatment Engineer Must have had experience in the design of filtration plants, water softening, and iron removal. Registration desirous but not necessary. Consulting Engineering firm in the Midwest. State education, background and experience. P-8887, Engineering News-Record.

City Engineer—($8797-$10,731). Age 30-55; registered, graduate civil engineer, eight years experience in city engineering or related work with two years administrative experience, knowledge building construction required. City 70,000 population. Submit complete education and experience history with letter of application to Personnel Officer, Municipal Building, Hamilton, Ohio.

Estimator—General Contractor—Experienced —Commercial, industrial buildings—Allentown, Pennsylvania. Only estimator in office. State Experience and salary. P-8914, Engineering News-Record.

Civil Engineers: Unlimited opportunity with Rochester, N. Y. consulting firm. Excellent salary. P-8926, Engineering News-Record.

Structural Steel Sales Engineer. Minimum 5 years experience in sales of heavy fabricated structural steel for buildings and bridges to owners and contractors. College graduate and engineering experience preferred. Salary to be negotiated. P-8922, Engineering News-Record.

• POSITIONS WANTED

BSCE-MIT, PhD Rome Italy, US citizen, experience on both sides Atlantic. Would like to remain in Europe. Write Engineer, Vle XXI Aprile 34, Rome, Italy.

Const. Supt.; 20 years Institutional, Industrial, Commercial. Engineer. Anywhere. PW-8829, Engineering News-Record.

Civil Engineer, Registered, Member A.S.C.E., 25 years experience in Highway and Epressway Design, 10 years in responsible positions, interested in making permanent connection with consulting firm. Salary and location open. PW-8857, Engineering News-Record.

Struct. P.E. 30. 5 yrs. bldg. design exp. now employed. Seeks position with consultant or general contractor. PW-8855, Engineering News-Record.

Graduate Mining Engineer, 33, single, Canadian, 9 years varied mining experience in surveying, layouts, and contract administration—Interested in municipal work, construction, manufacturing, or sales—will travel or relocate in Canada or U.S.—Available one month's notice. PW-8862, Engineering News-Record.

Concrete Engineer—over 20 yrs. exp. on major projects domestic and foreign, seeks foreign assignment. Resume on request. PW-8891, Engineering News-Record.

Construction accounting-public relations executive, fluent Spanish, presently engaged highway program Latin America country desires financial-accounting managership Latin America Heavy construction. PW-8879, Engineering News-Record.

Qualified Piping Supt. Complete construction. Chemical, Power plants, Oil Refineries, Etc. R. Lee, 1112 North Cherbourne Dr., Hollywood 46, California.

Construction Controller—finance and control heavy construction projects. Thoroughly competent corporate accounting, reporting, costs, budgets, taxes, systems. Experienced all types contracts, corporate organizations, joint ventures. Knowledge French. PW-8925, Engineering News-Record.

• POSITIONS WANTED

Construction Engineer, BCE, Registered N. Y., Married. Age 37. Wants employment with General Contractor field or office. 11 years experience heavy construction oil refinery, chemical and power plants. Presently employed, available in about 10 weeks. For detailed resume write PW-8865, Engineering News-Record.

BSCE-35-ten years varied experience in field of commercial, industrial and institutional work. Interested in working in engineering or construction office or teaching. PW-8892, Engineering News-Record.

Construction Supt. General Construction. PW-8896, Engineering News-Record.

Formerly qualified land surveyor in Europe, graduated from proper survey school, 45, married, Canadian citizen, 11 years experience: Geodetic Surveys—1st order precise levellings (field work & adjustments) city & cadastre surveys. Since 8 years in well-paid position with known company as draughtsman-designer, seeks opportunity to switch back into original profession. PW-8893, Engineering News-Record.

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Superintendent of heavy excavation earth and rock. PW-8930, Engineering News-Record.

CE young ambitious concrete pipe experience desires work pipe, concrete, prestressed management, business, field, sales, versatile. Responsible hard worker. PW-8933, Engineering News-Record.

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Albert Pipe Supply Company..... 118
Associated Pipe & Fitting Company.. 118

Baker, Jr. Inc. Michael..... 115
Blackburn & Blauvelt..... 115

Concrete Equipment Company..... 116
Conmaco, Incorporated 118

Dorr-Oliver Incorporated 115
Drachman Steel Corp., Hy..... 117

Ehasz, Frank L..... 115
Electronics Surveying Corp..... 118

Foster Company, L. B..... 117

Harrelson Construction Co., Inc..... 115
Havre De Grace Shipyard Inc..... 118
Hoppe, C. B..... 118

Koch Crane & Derrick Co., Inc..... 117

McKee, Robert E..... 115
Memphis Equipment Company....117-118
Midwest Steel Corporation 117
Mississippi Valley Equipment Company 117

New York Raritan Corp..... 116
New York Trap Rock Corp..... 116

Overseas Americans Inc..... 115

Smith Inc., L. B. 118
Stanhope Inc., R. C. 117
Sverdrup & Parcel, Inc..... 115
Swabb Equipment Co., Inc. F..... 117

Walsh-Perini-Morrison Kiewit-Utah Companies 116
Williams Construction Co..... 117
Wilson Engineering Corp..... 116

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Armco Drainage & Metal Prod., Inc...2nd Cov.
Automotive & Aircraft Div. Amer. Chain & Cable 72

Bendix Computer Division..... 38
Bethlehem Steel Co..... 39
Blaw Knox Co. Constru. Equip. Div..... 71
Borden Metal Products Co..... 20
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Ceco Steel Prod. Co.....80-81
Celotex Corp. 75
Chicago Pneumatic Tool Co.....96-97
James B. Clow & Sons..... 3
Concrete Reinforcing Steel Institute..... 48

John Deere Industrial Div.....61-64
Detroit Diesel Engine Div.....30-31
R. E. Dietz Co..... 15
Dorr-Oliver Company, Inc..... 66

Gahagan Dredging Co..... 60
Garrett Corp. 37
B. F. Goodrich Co., Tire Div..... 1
Griffin Wellpoint Corp..... 60

Hamilton Mfg. Co..... 94
Homelite Div., Textron, Inc..... 68

Inland Steel Prod. Co..... 29

Kaiser Aluminum & Chemical Corp..... 67
Kerrigan Iron Works, Inc..... 11

Ladish Co. 91
Lead Industries Assn..... 106
Lehigh Portland Cement Company..... 79
LeTourneau Westinghouse Co.....53; 55; 57
Liberty Mutual Insurance Company.....40-41
Lincoln Electric Co..... 70
Lock Joint Pipe Co..... 18

Mack Trucks, Inc..... 4-9
R. C. Mahon Co..... 65
McGraw Hill Book Co..... 123

Portland Cement Association..... 14
Prescon Corp. 92

Remington Tools 87
Russell, Burdsall & Ward Bolt & Nut Co. 73

Servicised Prod. Corp..... 16
Sheffield Corp. Div. Armco Steel Corp..... 74
S. Morgan Smith Company..... 77
Socony Mobil Oil Co., Inc..... 103
Spencer, White & Prentis Inc..... 48
Stow Manufacturing Co..... 2
Stran Steel Corp. Div. National Steel Corp. 33

E. A. Thompson, Inc..... 12
Timber Structures 78
Torrington Co. 49
Tousey Varnish Company..... 95

The Union Metal Mfg. Co..... 58
U. S. Steel Corp.....46-47; 88-89; 99-101

Visking Corp. Div. of Union Carbide & Carbon Corp. 45
Vulcan Materials Co.....3rd Cov.

Westinghouse Electric Corp. Apparatus..104-105
Wheeling Corrugating Co..... 22

Yeomans Bros. Co..... 76

Professional Services 119-122

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F. J. Eberle, Business Mgr.

Employment Opportunities....114-116
Notices
Proposals 112-114
Equipment
(Used or Surplus)
(For Rent, Sales Wanted)...116-118

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Editorials

It's One (Technical) World

THIS PRESENT PERIOD is bringing forth some brilliant demonstrations of how the technology of construction can be encouraged to grow to everybody's benefit without the constriction of narrow national boundaries.

Most recently, dambuilders of 43 nations met last week in New York City for the Sixth International Congress on Large Dams. The week before, representatives of about the same number of countries convened in Montreal for the Canadian sectional meetings of the World Power Conference. And in less than a month members of the International Association for Bridge and Structural Engineering will convene with the American Society of Civil Engineers in New York.

The value of international exchanges of technical achievements and discoveries is nothing newly discovered, of course. All of us benefit from a rich legacy of learning from all corners of the world. But there is work to be done to make the exchange more fruitful.

It is evident at any international gathering of technical men that they have a common language, so to speak, even when they need interpreters to translate the words. This was pointed up at the large dam conference by an eminent engineering educator, Tokujiro Yoshida, professor emeritus of Japan's Kyushu University. Professor Yoshida observed that different methods of measurement in the study of rock foundations produce markedly different results, even when conditions are identical. "It is therefore necessary," he said, "to note the methods of measurement in detail [and] standardize them to some extent to be able to compare." He stressed the desirability of an early international symposium to take up the matter.

We think this a laudable suggestion—not so much for rock foundation measurements in particular but for engineering determinations in general. Progress in the direction of international standardization has been in the making for years, and any further activity aimed at advancing this cause is well worth encouraging.

How Sound a Requirement?

THERE'S A MOOT POINT raised as to value of exact numerical standards for pollution control by an article in this issue (see p. 34). In practical terms, it is a question of how long a $12 million sewage treatment plant—still under construction—will be acceptable in its present form; or how soon secondary treatment might be called for by the regulatory agency concerned.

The plant is under construction on the Hudson River in the City of Yonkers, just north of New York City. The regulatory agency is the Interstate Sanitation Commission, which has had jurisdiction over water pollution control in the New York-New Jersey-Connecticut metropolitan area since 1936.

It is an odd situation. The New York State Health Department has approved plans of this primary treatment plant. The plant is of admirable design. It will abate pollution to a considerable extent. Yet its ability to meet a specific (60%) suspended solids removal requirement of the interstate regulatory agency has been questioned seriously.

Will the new Yonkers plant accomplish this? Moreover, does it really matter?

Why must this plant pass not more than 40% of the 150 parts per million of suspended solids it will receive if another primary plant in the area may pass 40% of say, 450 ppm? The latter plant in this comparison would be permitted to contribute three times the concentration of solids as the former, to the same class of waters.

Westchester County and its consultants are to be applauded for the step they are taking with the new Yonkers plant to treat sewage now merely screened. But also to be applauded are those who challenge the sufficiency of this plant, for in so doing they are challenging what may be a somewhat meaningless numerical requirement it is supposed to meet. As long as this requirement remains, the question remains: How soon will secondary treatment be required if the primary plant falls somewhat short of the regulatory agency's mark?

On Student Guidance

GUIDING HIGH SCHOOL STUDENTS on careers as civil engineers in the construction industry is a worthy effort wherever it is found—provided it is done right. The right way is to tell the students; the wrong way is to sell them.

The most exemplary student guidance program of the engineering profession, perhaps of any profession, is that developed by Engineers Council for Professional Development. It is a telling, not a selling, effort. Those who direct the program and participate in it probably cause many students to choose engineering careers. But they do so through a conscious effort to inform, in order that the student's judgment will be that much better in choosing, or not choosing, engineering as a career.

ECPD's good work over the years in guiding students in all major branches of engineering is particularly noteworthy at this time as new efforts are reported at local levels to institute guidance programs specifically on civil engineering as a profession and construction as an industry. In New Haven, Conn., a Construction Industry Professional Development program, envisioning scholarships, is in earliest stages of formation, and in New York City a guidance program by civil engineers among Explorer Scouts is under consideration. Both could be outstanding successes, if pursued. But their successes will be measured by how widely and well they tell their story and by the quality, not the mere numbers, of those whom their story impresses.

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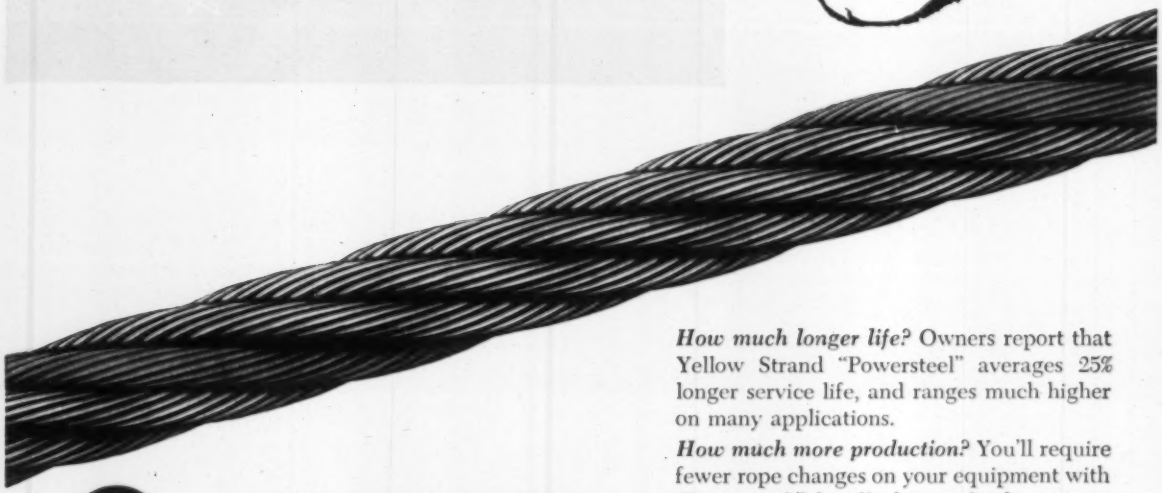

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